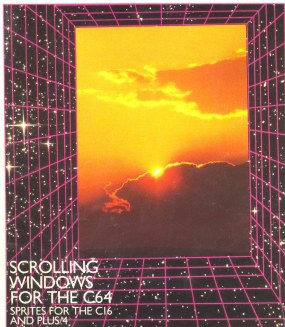


YOUR

# COMMODORE

AN ARGUS SPECIALIST PUBLICATION

AUGUST 1987 £1.10



## SCROLLING WINDOWS FOR THE C64

SPRITES FOR THE C16  
AND PLUS/4

- C64 MUSICAL PROGRAMMING ■ RS232 ON THE PLUS/4
- SCREEN DESIGNER 64 ■ AMIGA 500 - THE FACTS



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# AUTO DUEL

**SURVIVE THE  
21ST CENTURY DRIVING TEST**



**Drive aggressively and give way to no one.**

AutoDuel is a fast-paced, strategy role playing adventure set in the year 2030. A time when the American highways are controlled by armed outlaws, and when danger lurks around every bend.

Your aim is to earn fame and fortune. Compete in spectacular auto dogfights in true gladiator style – the prize money will buy you a powerful custom-built vehicle equipped with lethal weapons, including lasers, machine guns and flamethrowers. Undertake lucrative courier runs for the American AutoDuel Association or become a vigilante of the open road. Sometimes on your travels between 70 cities are the vital clues you will need to complete the final mission.

Only the most cunning road warriors are enlisted by the FBI to drive out the ultimate evil forces. Will you gain honour and entry into the elite circle of AutoDuelists?

**AutoDuel.** Pick up the gauntlet. Available on disk for the Apple, Commodore 64, Atari, Atari ST and Amiga. Prices from £19.95.

Based on the award-winning Car Wars board game by Steve Jackson.

THE JOINT VENTURE IN EUROPE





# DATA STATEMENTS

## Arcade Score

Imagine Software has released *Mag Max*, an arcade game for the C64, priced at £8.99 on cassette and £12.95 on disk.

The game is a conversion from a Nintendo coin-op machine and features the creation of the robot *Mag Max* and his life-saving mission.

The game is set on a once civilised planet, now ravaged by the Mechanooids. Just before being annihilated, a team of scientists finishes the robot *Max*. However, the robot is split up with its body in a bunker and its vital components scattered around the planet. The player must collect all the pieces and reassemble against the enemy.

Starlight Software, the new label from Amulet, was recently launched with the release of three titles. The new games are *GreYdR*, *Starlight 2887* and *Deathscope*. There are two others on the drawing board, *Red L&S* and *Spyfire*. All these releases are for the C64.

Marzoch is in the final stage of completing a new C64 title, *Mega-*



*Apocalypse* programmed by Simon Nichol (above) with graphics by Rob Stevenson and music by Rob Hubbard.

*Marzoch* is now looking for skilled shoot 'em up addicts to playtest the fast and furious new game. If you're interested you should write to Marzoch stating your scores in at least three of these classic shoot 'em ups: *Crazy Comets* (Marzoch), *Orbitron* (Hermann), *Delta* (Thalman) and *Dropzone* (US Gold).

If you come up to scratch you will

be invited to a secret location to test the game and will get your name immortalised in the *Galactic Hall of Fame*.

Gremlin has released *Alien Invasion - the Story* set in the aftermath of a nuclear holocaust. The survivors are living in underground complexes and now after years of research have created an android, *Cyborg 64*, which should prove to be the answer to their prayers.

*Cyborg 64* must attempt to clear the Earth of the strange aliens which have made their home on the planet's surface since it was abandoned by the human race. However, the problem is great since when an alien is destroyed a new breed arises from its remains.

## Touchline

*Gremlin* 6 Central Street, Manchester M2 5AS. Tel: 061 432 6035.

*Marzoch* Mega-apocalypse, Marzoch House, Bay Terrace, Penrith, Cumbria. Tel: 0924 4444. Fax: 0924 764676. *Starlight* 68 Long Lane, London WC2E 8NN. Tel: 0706 3447.

*Gremlin* Alpha House, 10 Carrer Street, Sheffield S1 4FS. Tel: 0747 753423.

## Amiga News

Triangle Television, the company which specialises in computer audio-visual systems, has opened a new sales department exclusively dealing with Commodore Amiga systems.

Triangle's Peter Barrett said: "Our new department offers a complete range of facilities including Amiga sales, and a full range of software with a 24-hour mail order facility. We also offer a comprehensive Amiga Training programme for Audio Visual and business users and we have an exciting research and development section which is working on a new range of devices to exploit the full potential of the Amiga in the AV and Video environment."

Precision Software has slashed the price of the powerful *Superbase Personal* by a third.

*Superbase Personal* was launched

last autumn and since then 13,000 copies has been sold. The new lowest version was available at the Commodore Show in June. Previously £149.95, the package now costs £99.95 including VAT.

S&S has plans for four new games for the Amiga.

The titles to look out for are *Kampftrupp*, *Rescue 260*, *Planetbase* and the new role-playing adventure, *Phantoms II - the Wrath of Nihiladon*.

## Touchline

*Triangle* 130 Broadwood Road, London SW18 5JD. Tel: 01 874 3418.

*Precision Software* 5 Park Terrace, Worcester Park, Surrey KT6 5ZJ. Tel: 01 338 7166.

*S&S* 475 Gold Chain 2/3 Watford Way, Redditch, Birmingham B4 7AX. Tel: 823 335 3388.

## Budget Games

Freight has recently launched two new games for Commodore owners, *Zeus* is for the C64. The idea of the game is to fill 75 per cent of the screen by creating blocks of colour while avoiding fast moving white balls. The more action you fill the more points you score but as you progress on to higher levels there are more white balls whizzing around to take a life away, and you only get four.

C65 owners will be delighted at finally getting their own version of the popular C64 title *Thrust*.

You are a dedicated member of the Resistance and are about to launch a big offensive against the Intergalactic Empire using captured warships. The problem is that the power supplies for the ships are still held in the Empire

storage plant and you have to retrieve them.

Both these Firebird titles are on the Silver label and therefore are a mere £1.99.

Mastertronic also has two new releases, both for the C64.

*Frontier* is a fast shoot 'em up with 40 levels in which you must use your lethal Startron to blast your way through hordes of aliens before they reach the cross. This title costs £1.99.

Next comes the second C64 title from Mastertronic is £2.99. It is a Jell-Master game in which you must blast away thousands of enemies while trying to learn up to 30 different types of ship formation.

#### Touchline

*Firebird: 64 New Oxford Street, London WC1A 1PS. Tel: 01 379 6723.*

*Mastertronic: 6-10 Paul Street, London EC2A 4PW. Tel: 07 377 6680.*

#### Wargaming

Cascade games has released a Vietnam game based on the chain-sapping Paul Handcastle single of a couple of years ago, *Nitroven*.

The game features a 19 year old soldier who must either try and avoid the draft or go and fight in Vietnam. If you try and avoid the draft the game becomes a text graphic adventure featuring the activities of the Peace Corps. If on the other hand you decide to go and fight, then you will be playing an arcade action game.

The game includes a soundtrack by Bob Halbfahrt and a coded version of the single.

PSS has released another wargames compilation, *Conflict II*. The new bumper pack features three games in the Great Battles of the Pacific theme.

*Conflict II* is for the C64 and the games included are: *Battle for Midway*, *Isle Anna and Okinawa*. The last of these is a brand new title.

#### Adventure and Strategy

Virgin has released another game based on the interactive fiction books by Mark Smith and Jamie Thomson. The latest game in the series is *Falcon - The Penopgale Lord* and is the sequel to *The Way of the Tiger and Shogun*.

The player takes the role of Falcon, an agent of the Temporal Investigate and Monitoring Executive. The game is set in 800 AD and there are eight different time zones to visit in order to collect important time artefacts. To complete the game the player must accomplish three missions.

Available on the C64/128, *Falcon* is out on cassette at £9.95.

Fans of the *Kiv Trilogy* from Incentive can now get all three adventures on disk for only £9.95. The trilogy comprises three separate adventures: *Moonbase of Kiv*, *Temple of Vain* and *The Final Mission*.

Dream has also released a game based on a popular book. *Tai-Pan* is set in the China of the 1840s and is based



*Screens shot from the Spectrum version of 'Tai-Pan'*

on the novel of the same name by James Clavell.

Assuming the role of Dick Szeen who starts life as a penniless trader, the player's objective is to become the Tai-Pan, a merchant prince of the Far East who accumulates riches beyond imagination.

*Tai-Pan* offers a variety of gameplay, either as a straight trading game, as a trade adventure or a shoot 'em up piracy operation.

It's available on Commodore cassettes at £9.95 and disk at £12.95.



*Screens shot from the Amstrad ST version of 'Tai-Pan'*

#### Touchline

*Virgin Games: 2-4 Foxton Yard, Burnside Road, London W11 2BQ. Tel: 01 727 8070.*

*Incentive: 2 Minerva House, Colville Park, Aldermaston, Berks RG7 4JW. Tel: 07355 77288.*

*Dream: 6 Central Street, Manchester M2 3BS. Tel: 061 632 6633.*

## Tune Into Teletext

Microtest have announced the availability of their eagerly awaited tuner. A video is no longer required to receive Teletext like Cefas or Oracle on the Commodore 64/128.

The Microtest tuner is now available for use in the UK and has been designed specially for use with the Microtest Teletext adaptor; it uses an advanced tuning system - no more

fiddling with knobs as it tunes itself!

The system allows teletext pages to be saved to disk/tape/ie or printed out and advanced users can access teletext from their own programs, providing endless possibilities. The teletext services hundreds of pages of up-to-the-minute information absolutely free.

The complete system consists of a

teletext adaptor, tuner, power supply, software on cassette (easily transferred to disk), connecting lead and a manual and costs £104.00 inc. p/p (plus £9.50 for 1240 version).

### Teachline

Microtest: 7 Brinkley Close, Morden, Hampshire PO8 8PW. Tel: 0705 303666.



## Get Lucky

The FA Cup Final at Wembley was a special occasion this year for Ian and Andrew Bagg. They were the winners of the Addition/Prison Football Manager competition. The prize was a day out with Kevin Torms, author of the game, at the FA Cup Final in which Coventry beat Tottenham Hotspur 3-2. Unfortunately, the Baggas are Spurs fans but they seem to have enjoyed their day despite the disappointing result.

Kevin Torms said: "Although Spurs have achieved great success in Andrew's living room, including a double, his first actual trip to Wembley didn't produce the scoreline he was looking for. I think, though, judging from the look on his face, that Andrew

enjoyed just being at Wembley for real."

Meanwhile on the TV, Rainbow's Starship has achieved national fame by being featured on Saturday morning's ITV children's program, *Get Fresh*. The game forms part of a competition called Get Lucky and there are three heats every morning in which Starship is played for 50 seconds. The competition continues until the end of August when the winners will carry off a Commodore Amiga system for their school.

### Teachline

Prison: Unit 1, Baird Road, Enfield, Middlesex EN1 1ST. Tel: 87 804 8180.

Rainbow: Unit 1, Baird Road, Enfield, London W11 1PS. Tel: 81 240 8838.

## Communications

Comp-U-Card, the home computer shopping service, has announced a new online facility for Postal members.

New subscribers can dial up the Comp-U-Card at local telephone rates throughout the UK.

The service is part of a £1 million investment and as a further incentive, new members are being offered a three month free trial.

General manager, John Slater commented: "This additional service now offers our members faster, more direct access to our database of over 20,000 top name products, all guaranteed to be at the lowest available prices. From May 1 a subscriber in John O'Grady's will be able to use the new system as economically as someone in our home town of Windsor."

Compuart has announced the launch of *Federation II*, its new multi-user space game. Commodore owners were first to give the game a try last month but owners of other computers only have to wait until the autumn. However owners of any micro can have a go in a limited single user demo version.

*Federation II* is the biggest multi-user game ever written. It can handle up to 128 players at once and has up to 2500 locations, depending on the number of people playing.

*Federation II* is multi-layered, it has exploration, trading, fighting and strategy and can be played on any of these levels.

## Touchline

**Comp-E-Card:** 1 Elm Court, Elm, Windsor, Berks SL4 6BT. Tel: 0752 80352.

**CompuNet:** 7-11 Alfreya Road, London NW10 6NU. Tel: 01 963 8886.

## Legal News

Software is once more making legal news with the setting up of the National Software Register.

Many people are confused about the law of copyright which is the only law currently in force which can protect the programmer's rights.

The NSR has been set up to establish evidence for programmer's when claiming copyright of a piece of software.

The law currently states that the moment a program is written then the copyright belongs to the author. The NSR will allow a programmer to gain a certificate of registration as soon as he sends a copy of his program to the register. On receipt of a program in hard format together with a standard fee, the NSR will make a copy for security purposes, storing the original and the copy in different locations. The author will receive a Certificate of Registration and the contents of the program will not be revealed except by permission of the author.

The Data Protection Act has recently come into force and despite a lot of publicity in the computer and the national press, many people are still uncertain as to what it can mean for them. A series of free booklets has been published by the Data Protection Registrar's office and these can be obtained by calling the number in Touchline.

## Touchline

**The National Software Registry:** 213 Chase Side, Exford, Notts LE12 0RA. Tel: 01 307 9700.

**The Data Protection Registrar:** Springfield House, Water Lane, Wilmslow, Cheshire SK9 3AE. Tel: 0625 337777.

## Technology and the Disabled

KIPUG, the Independent Commodore Products Users Group, has recently appointed a Disability Liaison Officer, David Bate, to its National Committee.

David's brief is to provide assistance and advice to disabled computer users. One of his key functions is to advise disabled users what aids and adaptations are available, where they may be purchased, and how to obtain assistance from the DHSS or other organisations to procure them. To accomplish this David needs information from manufacturers and resellers of this type of equipment as well as feedback from users of these items.

Even people with a severe physical disability can use computers quite extensively and not least for things such as word processing and communications. Sometimes special keyboards or other input devices are required but in many cases only small aids are required which can make routine tasks like changing floppy disks or feeding paper into a printer infinitely less frustrating.

If you (or your company) have items which may be of help to disabled computer users or if you have ever used any such devices please contact the KIPUG Disability Liaison Officer, Mr. David Bate. Literature and first hand user information are always needed and welcome, but actual samples of an aid or adaptation are particularly useful as these may be evaluated in actual use. Any samples will be returned if requested.

This new KIPUG aims to help the disabled help themselves. Any and all assistance will be greatly appreciated. It may be of interest that David is himself disabled and so has first hand knowledge of the problems faced by users like himself.

## Touchline

**KIPUG Disability Liaison Officer:** David Bate, 71 Bedford Road, Accrington, Lancashire LA2 7BN.

## New Face at Commodore

Commodore Business Machines (UK) Ltd have recently appointed Steve Franklin to the position of General Manager to the Maidenhead based home and business personal computer company.

For the past two and a half years, Steve has been with Granada Business Centres as sales and marketing director and prior to this was national sales manager for the advanced systems division of Ilex Xerox.

Steve has had extensive experience in selling a vast range of IBM and compatible business systems, networks and peripherals. Combined with business and marketing flair, this will help to push the company's further towards into the business market place with the new Commodore Amiga A2000 and advanced PC series product ranges.

## Touchline

**Commodore Business Machines (UK) Ltd:** Commodore House, The Switchboard, Gardens Road, Maidenhead, Berks SL6 7TA. Tel: 0628 74426.



Steve Franklin



# I.Q.

*If you hate shouting aliens and feel that you need something more intellectual to stimulate your grey matter then look over this selection of games.*

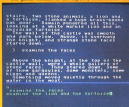
## BRIMSTONE

As adventure games become ever more sophisticated, it seems that calling them adventures just isn't good enough any longer. Infocom call their games interactive fiction. Broderbund have just released the electronic novel - or rather three of them. So just what do these games have to offer that warrants them being called something different?

Well to start with, they are all disk-based. This means that the stories can be bigger and better than tape-only games but it should be noted that American companies don't go in for text compression. For, say, Level 9. But there again, these games take up three or four sides of disk.

Then there's the packaging. This is one area where the Yanks leave the Brits standing. You are just itching to taste the fruits off the shelves and have a look inside them. As a bonus, it also makes the games that much harder to pirate. Backing up the disks is easy - indeed, they even suggest that you do so but it is not worth your while running off an extra copy for your friend as the, er, needs all the extra bits and pieces in order to play. In the case of Electronic Novels, you get a 160 page hardback book containing details of storyline, illustrations, space for maps and summaries of the game's commands.

The games themselves are superbly constructed. The



descriptions are both lengthy and atmospheric. Smells and sounds abound, things that no illustration can ever depict. The puzzles too are both original and logical and succeed in drawing you into the story. The games feature an excellent and sophisticated parser and other characters in the plot exhibit a fair degree of independence.

A thesis in Oblique Triangular Philology is enough to bore the pants off anyone and Jeremy Dodder is no exception. So one day, having aside all medical references

to Saint Slog, he inadvertently steals a manuscript all about Sir Gawain, one of King Arthur's Knights of the Round Table. Much more exciting although it does lead to Jeremy's arrest and imprisonment. However, he has time to mail the game to a leading software company, exchanging all software rights for an attempt to release him.

The year is 1317, the date, All Hallows. Gawain (i.e. you), is having trouble keeping his eyes open as Bedevere plucks at his hair. Quickly he drifts into a deep dream and awakes to find himself outside a castle. Getting in is no problem, but how does he get the magical suit of armour? He sees several people that he recognises, including Merlin. Adam, his battle tutor, but there is something treacherous in the air and Gawain finds himself being tried by a court of demons.

Imprisoned in the same cell as a certain Jeremy Diddle, you manage to escape with the help of a bat-eared gargoyle. You are led to the entrance of the underworld with but twenty-four hours to make good your escape. If you are to succeed, you must first overcome such problems as the Green Knight, the White Apes and Magician Disko.

It's a long haul, you through the story, chapter by chapter. Likewise, the problems get that little bit harder as you progress so that you can get well and truly involved in the game before you get really stuck.

G.R.H.

**Twinkl**

**Title:** *Brotherhood Machine*; **C64** - disk only **Supplier:** Brotherhood/MUS Gold, Units 2/3, Hatfield Way, B'ham B8 7AZ. **Price:** £24.99

**Originality:** 9/10 **Graphics:** 9/10 **Gameplay:** 9/10 **Value:** 9/10

## MINDWHEEL

The second electronic novel, *Mindwheel*, is a strange mixture of science fiction and fantasy. Civilisation in The Federated Nations is collapsing. Tensins are being ripped apart by packs of wild dogs. Hunting and looting in the streets is rife. A link is discovered in a nerve gas stockpile. The apocalypse seems inevitable.

Only one man understands exactly what is going on. Doctor Virgil is looking for a volunteer to travel through time in order to retrieve the Wheel of Wisdom.

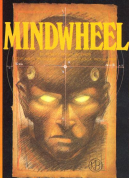
Doctor Virgil has been researching into neuro-matrix mind travel. By telepathically journeying through four different minds, you (for how could you fail to volunteer) can be transported to the Cave Master, owner of The Wheel, at the very Dawn of Time.

You remember the Doctor throwing a switch in his laboratory, but your next awareness is that of being incense sage, accompanied by a backing group and in front of several thousand screaming fans. You are in the mind of Bobby Clemens, wannabe rock star. A huge video screen above your head is showing close-ups of your death. A fan tries to climb up on stage and reach you but is deterred by a bulky bodyguard.

Although you have never been aware of any musical talent in your previous existence, the crowd obviously expect you to sing and, to your surprise, you soon find yourself playing the keyboards with words pouring out of your mouth. Not your own words, mind, but you are convinced of their significance to your future journey.

Nextstage, a woman urges you to follow her, and you do so, up a winding staircase. A winged woman in a cage blocks your path and you have successfully answered a riddle. Only then are you free to enter a castle that lies beyond.

## AN ELECTRONIC NOVEL



The castle belongs to The Generalissimo, one of the more feared dictators of his time and the second of your four minds. Eventually executed for war crimes, his domain includes such problems as passing a guard, half of stone, half human, and answering yet another riddle. You go on to discover a tribe of animal-headed children.

There are yet two minds left for you to discover. A poet, composer of your culture's great epics and Dr Eva Fenn, a sort of female Einstein who specialises in the manner of nature and was once a schoolmistress of The Generalissimo... the plot of *Mindwheel* can best be summed up as weird, but the game is no less fascinating for that - even if I haven't got a clue what is going on.

G.R.H.

**Twinkl**

**Title:** *Mindwheel Machine*; **C64** - disk only **Supplier:** Brotherhood/MUS Gold, Units 2/3 Hatfield Way, B'ham B8 7AZ. **Price:** £24.99

**Originality:** 10/10 **Graphics:** 9/10 **Playability:** 9/10 **Value:** 9/10

## BREAKERS

The third of this month's Electronic Novels is uncharted science fiction. The planet Borg, hidden in the deep recesses of the outer tentacles of the Ring Nebula, is the home of the Las people. It is also a haven for evil.

Every sort of mutant, criminal and drug-seeker gravitate towards Borg at some stage in their career. The planet is

supposed to be a centre of intergalactic slave trading but this tends to be a cover for other criminal activities. Corruption is rife. Everybody is out to look after number one. As a Breaker, you fit seamlessly into the background.

There is a general air of panic around the bar where you are quietly getting drunk. The consolidation Garko seems to be disappearing and tradition has it that when this happens, the planet will either be destroyed or saved. Are you interested or do you order another drink?



As there is not much of a game in the latter option, you immerse yourself in the role of hero yet again. The game begins with you trying to escape from the clutches of a Gark patrol that has just entered the bar. This is done with the aid of some friends although you are unsure as to how far you can trust them. You seek temporary refuge in the cellars below the bar.

Have you find a strange red ball that seems reluctant to be picked up. There is also a newspaper cutting that should prove useful to you later on when you practice the ignoble arts of torture and interrogation. You soon discover that you are being followed by Naze Grey, although you don't have a clue why. Of more immediate concern to you is how much gold it costs to persuade a Gark to look the other way for a few minutes.

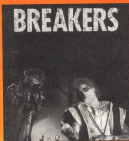
All these games work well because they are proper stories not a collection of loosely associated problems. The atmosphere within the game is superbly built up and the only major criticism that I can come up with is one that can't be

laid on Breakers itself. Everything is accused from debt, and, with the 1541 not being exactly renowned for its speed, playing the game doesn't exactly flow very smoothly. That apart though, all three Electronic Models are unreservedly recommended.

G. R. H.

#### Touchline

**Title:** *Breakers Attackline: C64 - disk only Supplier:* Breakers/MS **Gold:** Disc 2/3, **Refined Play:** 8/10 **MS:** 2/3 **Price:** £24.99 **Originality:** 8/10 **Graphics:** 8/10 **Playability:** 8/10 **Value:** 8/10



#### ELECTION

It was inevitable that all the hype surrounding the General Election would spawn a computer game spin-off. It was also inevitable that it would be awful.

In this remarkably silly game you play either Mather, Nenecek, Gwing, Big Ivan or the leader of the Idealist Party Daniel Pauls. The object of the game is to move your party leader, or his head, anyway, around the game world, representing districts of a town in order to canvass for votes. You do this by asking for support or bribing with gifts or incentives (transferrons, knight-hoods, chains and garms) in order to win 101 of the 199 votes available.

Once you've gained the support of one of the computer-controlled characters you can order them to either help you (i.e. follow you around), canvass another character on your behalf or stir another character or party leader. Starring is essential if you're going to win the election as it weakens the target and they finally disappear leaving only a banana skin.

As the game proceeds you'll notice that even your own supporters will need convincing to keep them in line, that 101 votes is almost impossible to get, you'll be bored silly before you collect 50 votes - and the other party leaders come back even when they've been destroyed.

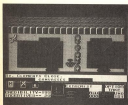
Maybe by the next Election someone somewhere will have written a decent Election game.

T. R. L.



**Touchline**

**Title:** Election. **Supplier:** Virgin. 3-4 **Peripherals:** Bond London WJ1 203. **Machine:** C64. **Price:** £9.95. **Originality:** 4/10. **Graphics:** 3/10. **Playability:** 6/10. **Value:** 8/10.

**TEMPLE OF TERROR**

The Fighting Fantasy books by Steve Jackson and Ian Livingstone are far and away the best-selling children's books in this country. It's therefore a natural progression to translate them to computer format.

The idea behind the books is that as you follow the story, you are often presented with a number of choices. Depending on your choice, you are referred to numbered paragraphs which in turn continue the story and lead to further choices. The action includes combat sequences which can be resolved by rolling dice.



Temple of Terror employs a fantasy setting in which you must search for five Dragon artifacts which have lain hidden for centuries in the lost city of Valak. The reason for your quest is to prevent the dark elf, Malphas, finding the

treasures first. It might complete his mastery of the dark arts...As is usual in this type of game, you are the only one facetiously enough to volunteer.

Frankly the game is itself a little or no-atmosphere is created. The graphics are nothing special. The parser is crude by modern standards and there are several spelling mistakes which give the whole thing an amateurish feel.

What is worse is that US Gold expect you to fork out nearly ten quid for the game. First if it were worth it but object to paying even a budget price for this. Incidentally this is no reflection on Jackson and Livingstone. The books are excellent value for money. Go and buy a few of them instead.

G.R.H.

**Touchline**

**Title:** Temple of Terror. **Machine:** C64. **Supplier:** US Gold. **Units:** 2/2. **Modified Wp:** 0/None. **RAM:** 16K. **Price:** £9.95. **Originality:** 4/10. **Graphics:** 3/10. **Playability:** 4/10. **Value:** 1/10.

**THE SHADOWS OF MORDOR**

If you think hobbits are huff-duffing and you have nightmares about orcs, halibogs and ring waiters then you'll have already missed The Hobbit and the first part of Lord of the Rings. The Shadows of Mordor continues this epic tale in part two of the three game series.

As in part one you control hairy hobbit heroes Sam and Frodo as they continue their quest to destroy the ring of power that controls and enslaves all others. As the game begins Frodo and Sam have left their companions on an island in the middle of a lake and have secretly gone on alone to continue their quest. Their objective is to cross the desolate wastelands and survive the trek through the evil mountains that surround Sauron's homeland.

The Shadows of Mordor is a traditional adventure with a vocabulary of over 800 words. Unlike the first game and, indeed, The Hobbit, this game is mainly text with only a few crude graphic screens to illustrate Tolkien's Middle Earth. Consequently it relies heavily on its text descriptions and improved interaction with the other characters. Now you can give Sam a whole string of commands instead of entering them one at a time. Whether he carries them out or not is another matter and depends on his state of health and hunger. Similarly, you could take the role of Sam and order Frodo instead or if you're feeling brave you could control both directly and swap between them using the Become... command. Obviously, this adds dramatically to your problems and so its best to allow the computer to take on one of the other until you know your way around.

The game is supplied in a massive box containing the second book in the series that may provide some useful tips and, of course a map of the area. The game does differ from the book, but only to provide a better game rather than an Adrian Mole style multiple-choice story.

Unlike the first game that lacked dynamism because of the book's plot the action really heats up as the end of the quest is at last in sight although you'll have to wait until part three to have at last the chance to destroy The Ring in the Crack of Doom.

If you've played Lord of the Rings then you'll realize that the emphasis of this game is towards interesting, which should please Tolkien fans. Perhaps the last part of Lord of the Rings will be text only?

T.H.

## Touchline

**Title:** *The Shadow of Murder, Supplines: Macintosh/Windows Name, 3-75 Paul Street, London WC2P 1AM*  
**Hardware:** Cnd Price £12.99 - Disk £9.99 - Ccsmn  
**Originality:** 5/10, **Playability:** 7/10, **Graphics:** 4/10, **Value:** 7/10

## BUREAUCRACY

What could possibly go wrong? You've just landed a great job at the Happies corporation, moved to a new town, and are about to leave on a two week trip to Paris which is being paid for by your new employer. What could go wrong? Everything! Your bank refuses to accept your change of address form and won't send you another one, Happies has sent your tickets to your old address where the new owner has just discovered the dry rot and has decided to forward your post to the bank instead and you have to be at the airport this afternoon! This could only happen in a Douglas Adams story that just happens to be part of an Infocom adventure called *Bureaucracy*.

This dynamic combination has already produced the adventure version of the Hitchhiker's Guide to the Galaxy. This time you must battle through a sea of red tape.

The game disk is accompanied by the usual high quality Infocom packaging that includes a letter from Happies, the first issue of *Popular* magazine and an application form for the Bigger credit card. This form is an example of the fictitious but all-too-familiar (Douglas Adams bureaucracy that you'll have to face in the game as it consists of an original and two carbon copies which have different questions and, more important, conditions of use. For example, on the original you agree to pay any charges against your account, but on the copies you agree not to use the card to buy anything and to let Bigger sign your name for anything anywhere leaving you to pay the bill!

Unfortunately, you can't start playing the game until you've filled in another on-screen registration form that prompts you for answers such as your name, address, girlfriend's name, job before the last one and previous girlfriend. This information is then used to 'personalise' the game and also cluster up your answer phone with messages to remind your blood pressure soaring. If your blood pressure gets too high then you lose the game as you blow your top. However, that's going to be easier than solving the game and dealing with unwanted salesmen, bank tellers that direct you to closed counters, people who answer in a thought you can hear them when you phone, a fancy parrot, an old lady with a shotgun and a waitress in a restaurant who takes your order (burger, what type?, fries or jacket potatoes, salad, which dressing etc. etc.) then goes off duty leaving you to repeat the order - only to be brought the exact opposite.

This may sound amusing - and it is - but it's also incredibly funny and a challenging sequel to the legendary Hitchhiker's Guide. Unfortunately, as if part of the plot, the game is only available on machines supporting 128K so Cnd owners can't play it. Now you've got no-one else to get an Amiga or a C128. If that feels like a friend with one, they'll need the help!

T.H.

## Touchline

**Title:** *Bureaucracy, Supplines: Infocom (Distribution) Machines: C128, Price: £14.99*  
**Originality:** 10/10, **Graphics:** 10/10, **Playability:** 9/10, **Value:** 8/10

## CARMEN SANDIEGO



Here's your chance to do a bit of detective work and break up on geography at the same time. Carmen Sandiego is the leader of a gang of art thieves, international terrorists and general ne'er-do-wells.

Your mission starts with a note from Interpol giving details of a nationally important art treasure that has just been lifted, immediately jettisoned off to the scene of the crime, you find that there are three possible places to investigate. These will give you clues as to the next stop on the thief's itinerary. Each investigation is a time though and you only have until the end of the week to catch up with your suspect. When you think that you know where he or she has flown to, you can go and catch a plane. Remember that plane journeys and sleeping also cut away at your available hours.

As well as following your suspect, you also have to make a possible identification and get the necessary arrest warrant issued. As you investigate, you will pick up clues as to the personal habits of your adversary and these can be fed into the Interpol computer. For example, you may find that there are two men who have tattoos and black hair - but only one of them plays croquet.

The clues range from the simple to the impossible - but help is at hand. Accompanying the package is a *World Almanac* - nearly 1000 pages of closely packed information and it is from here that you are supposed to find out your answers. For example, which nation has stamps as its major export or even where Kigali or Mlango are. Your clues include currency, flags, industries, provinces and famous landmarks.

When you catch up with a thief, meaning you have a warrant, the criminal is arrested and your record updated. Solve enough cases and you earn promotions. The game is sleekly presented - all menu-driven with some nice cartoon graphics. My only real grumble is that extracting the information from the Yearbook is not particularly easy. Perhaps a database on disk could have been included instead. Even so, the format works well and should appeal to anyone revising for O-Level geography. Perhaps Broderbund may like to consider a 'Where in Britain...' version.

G.H.H.

## Touchline

**Title:** *Where in the World is Carmen Sandiego Machine: C64, disk only, Supplines: Broderbund/MVS Gold, Units 2/1, Watford Way, Rickmansworth, Bucks. Price: £29.99*  
**Originality:** 9/10, **Graphics:** 7/10, **Playability:** 8/10, **Value:** 8/10

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# Facing Up To Printers

*If you're bored with Commodore's own product, a printer interface may be what you need. We look at one of the options.*

*By Eric Doyle*

**G**ee whiz! I wish I could afford a printer but the thought of an extra £80 or more for an interface really puts me off. Although Supra's G-Wiz is not dirt cheap it certainly saves on what you could be paying. After all what's £20 on the cost of a printer?

Any serious computer user will always reach a point where they wish they had access to a printer. For many this means dishing out to buy one of the Commodore range of machines as soon as funds permit. A Commodore printer is like a Chinese meal, you soon wish you had settled for something more filling and once again you wish you had a printer!

The answer is not to dash out to the shops but to sit and think for a while. Before long you realise that there are better printers on the market but how can they be hooked up to the C64? Nearly all of the possible candidates are parallel printers but the C64 only supports serial connection. The answer to this problem involves more expense: buy a serial/parallel interface.

The thought of more codes and switches could strike fear into the heart of the bravest programmer but the interface is probably one of the most user friendly add-ons available. G-Wiz is certainly that.

## Open the Box

The G-Wiz interface is a box measuring 140mm x 30mm x 25mm. Three cables from the main unit terminate in suitable connectors for the printer, the serial port on the C64 and a cassette port connector which taps off a power supply for the interface. Don't worry the power

connector still allows you to plug the cassette recorder in.

There are two basic modes for accessing your printer through this device. First and most famous is the transparent mode. In this case you can use the printer as a normal printer for use with software which has all of the necessary conversion software built in. It is also necessary for the correct operation of some advanced graphics modes which certain printers possess.

The second and more usual mode is ESI5 emulation. This is an example of a double bluff. The C64 thinks it is talking to a Commodore VIC 1525 printer and the printer thinks it is talking to any old computer. The unit's in-built emulator translates the Commodore ASCII characters into standard ASCII and the normal file opening and commands which are only addressable to a 1525 may be used. More than this, the special codes for specific printer features such as italic, condensed, underline and superscript modes can still be sent.

The unit is designed to give compatibility with a wide range of printers: Star, Epson, Okidata, Smith Corona Faxnet 80, Pro-Writer, NEC, Panasonic amongst others. The problem with such a selection is that the interface has to be that much more versatile. Some printers need line feeds, other have them built in, you may want the printer as Device 4 or you may prefer Device 3. To combat this there is a bank of eight switches on the rear of the interface. A checklist of printers and corresponding switch settings is given on the unit itself as well as in the comprehensive 96-page manual.

## Peculiar Commands

Another advantage of the G-Wiz is its ability to convert the peculiar commands in PRINT statements into recognisable codes when printing was listings. For example, instead of a reversed beam for clearing the screen the listing would show the following: [CLR]. In this way the interface solves a lot of the problems inherent with the standard Commodore printer's method of displaying listings.

The best test of an interface is whether you realise it's there or not. In tests I found that I could forget about the printer most of the time but the one time it needed attention I was glad of it! When using the Superscript word processor I was able to send the command 'LDR' which means that the interface is effectively switched to transparent mode. This means that I can tell the program that I'm using a particular printer and use all of the facilities to produce a professional look to my documents.

The only problem with looking up the unit is that it can only be unlocked by unplugging the cassette interface and then plugging it back in. If the computer is powered up at the time, clumsy hands could cause a short and damage the computer. I would suggest that the first thing to do is to fit an on/off switch on the power supply cable to overcome this danger.

G-Wiz is a superb unit which does all that I need, the manual is not only clear but also includes hints and tips which I have not found anywhere else. At such a reasonable price it should prove a good investment for your current printer, and any you may upgrade to in the future.

99



# The Advanced Art Studio

*We look at the latest in computer art for the masses.*

*By Tony Hetherington*



There is a vast horde of CGA graphics packages and hardware additions. One of the best is Rainbow's recent Art Studio. This has now been extended to form the Advanced Art Studio and sold with the original in the same pack with two manuals and two tapes or disks.

The original Art Studio is an easy-to-use, pull-down menu driven package that allows you to draw shapes, select colours, define and alter windows and paint in a variety of user-definable brushes without taking your eyes off your creation.

Each option is accessed through a series of pull-down menus that are listed in a bar that occupies the top two lines of the screen (these lines can still be used as the screen can be scrolled down to reveal them).

From the Shapes menu you can select for individual points, straight lines, rectangles, triangles, circles and arcs. The position and size of the shape is displayed before you commit it to screen. These shapes can then be magnified 2.4 or 8 times to add fine detail, filled with colour and mixed with some different text sizes that can be custom designed with a font editor.

Although the Art Studio is fast and easy to use it does have its limitations with the main one being the use of

colour. Although graphics can be drawn in high-resolution mode, pixel by pixel, colour can only be applied in attributes across one character in size. It 'smudges' badly if two different ink colours are too close together. The results are highly detailed but bland. The Advanced Art Studio sets out to put this right by operating in multi-colour mode in which up to three ink colours can share a 400 colour cell with a standard background colour.

Colours for inks are selected from the colour menu that can also be used to establish priorities should the three ink colour limit be exceeded. Then the top three colours in the priority list are displayed. You can also list colours in a second list that should be excluded from operations such as point or clear. For example, if you draw a rough sketch in white and then mess up the rest of the drawing you could exclude white, then clear a window (that could be set to the full screen), and restore your original white outline.

As in the original Art Studio you can define the patterns that can form the Studio's brush bar with a lot more scope. In the Advanced Art Studio the brush can be as large as 12 x 16 pixels and contain three ink colours. These can then be used as a normal brush and modified by the exclusion command that can take out one or more colours and so







# War Games Special

*An exclusive offer of three Argus Press Software War games for the extra low price of £12.95*



**T**his month we're offering readers of *Your Commodore* the chance to purchase three of Argus Press Software's top selling war games for just £12.95.

## The Offer

The first game in the package is the popular *Legions of Death*. This is a historical simulation of the Punic wars in the period 264BC to 146BC. You take on the role of the Carthaginians, battling away with the Romans. The battles are for the control of the land and most of this simulation is centred on fighting at sea.

The game is icon driven making it a great game for both old and new wargaming hands.

Next of the *Budge* is the second game in the package on offer. This strategy game is based around the famous World War II battle. Options exist to allow you to play against either the computer or another human opponent.

Bringing up the rear of this excellent offer is the game *Jolly Rob It*. This is the follow up to *Jolly Rob* and is an icon driven simulation of the

American Civil War. The action takes place around an important bridge and offers one or two player options with a choice of three playing levels.

These three games are only available at this knock down price by completing the form on this page and sending it with a cheque or postal order for £12.95 (including p&ph made payable to Argus Press Software).

The address to send the order to is Argus Mail Order (YC), Units 1&2, Condon Developments, Watery Lane, Darwen, Lancashire BB3 1ET. Do not send any orders to *Your Commodore*.

## Please Note

These games are all for the C64 computer and are cassette based.

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YOUR COMMODORE august 1987

# Diskit 6

*This disk special will enable you to speed up the rate at which you can copy files from disk to disk.*

*By Les Allen*

**T**his utility enables selected files of up to 255 blocks in length to be transferred between diskettes. The DESTINATION diskette must be formatted prior to use.

## In Use

Boot up the utility, insert the SOURCE disk into the drive, press

RETURN and select Y or N to choose files to copy.

As many files as can be completely loaded into memory will be loaded. At the prompt insert the DESTINATION disk to save, repeating the process as many times as necessary.

Data transfer is at a speed of approximately six times normal load and save rates.

The program as listed must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run saves the relevant code as a temporary addition of 50000 and when prompted relocates the working program to Basic (50001) and saves to disk the program FAST FILE COPIER. The

```

PROGRAM: FAST FILE COPY
10 10=10768-40:10768-40=0
11 PRINTCMB(10768:10768)
12 10=10768-40:10768-40=0
13 10=10768-40:10768-40=0
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98 10=10768-40:10768-40=0
99 10=10768-40:10768-40=0
100 10=10768-40:10768-40=0

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70	68 DATA 84,8C,8D,8E,8F,90,91,92,93,94	78	68 DATA 81,82,83,84,85,86,87,88	86	70 DATA 8C,8D,8E,8F,90,91,92,93,94
71	68 DATA 84,85,86,87,88,89,90,91	79	68 DATA 81,82,83,84,85,86,87,88	87	70 DATA 8C,8D,8E,8F,90,91,92,93,94
72	68 DATA 84,85,86,87,88,89,90,91	80	68 DATA 81,82,83,84,85,86,87,88	88	70 DATA 8C,8D,8E,8F,90,91,92,93,94
73	68 DATA 84,85,86,87,88,89,90,91	81	68 DATA 81,82,83,84,85,86,87,88	89	70 DATA 8C,8D,8E,8F,90,91,92,93,94
74	68 DATA 84,85,86,87,88,89,90,91	82	68 DATA 81,82,83,84,85,86,87,88	90	70 DATA 8C,8D,8E,8F,90,91,92,93,94
75	68 DATA 84,85,86,87,88,89,90,91	83	68 DATA 81,82,83,84,85,86,87,88	91	70 DATA 8C,8D,8E,8F,90,91,92,93,94
76	68 DATA 84,85,86,87,88,89,90,91	84	68 DATA 81,82,83,84,85,86,87,88	92	70 DATA 8C,8D,8E,8F,90,91,92,93,94
77	68 DATA 84,85,86,87,88,89,90,91	85	68 DATA 81,82,83,84,85,86,87,88	93	70 DATA 8C,8D,8E,8F,90,91,92,93,94
78	68 DATA 84,85,86,87,88,89,90,91	86	68 DATA 81,82,83,84,85,86,87,88	94	70 DATA 8C,8D,8E,8F,90,91,92,93,94
79	68 DATA 84,85,86,87,88,89,90,91	87	68 DATA 81,82,83,84,85,86,87,88	95	70 DATA 8C,8D,8E,8F,90,91,92,93,94
80	68 DATA 84,85,86,87,88,89,90,91	88	68 DATA 81,82,83,84,85,86,87,88	96	70 DATA 8C,8D,8E,8F,90,91,92,93,94
81	68 DATA 84,85,86,87,88,89,90,91	89	68 DATA 81,82,83,84,85,86,87,88	97	70 DATA 8C,8D,8E,8F,90,91,92,93,94
82	68 DATA 84,85,86,87,88,89,90,91	90	68 DATA 81,82,83,84,85,86,87,88	98	70 DATA 8C,8D,8E,8F,90,91,92,93,94
83	68 DATA 84,85,86,87,88,89,90,91	91	68 DATA 81,82,83,84,85,86,87,88	99	70 DATA 8C,8D,8E,8F,90,91,92,93,94
84	68 DATA 84,85,86,87,88,89,90,91	92	68 DATA 81,82,83,84,85,86,87,88	100	70 DATA 8C,8D,8E,8F,90,91,92,93,94
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87	68 DATA 84,85,86,87,88,89,90,91	95	68 DATA 81,82,83,84,85,86,87,88		
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99	68 DATA 84,85,86,87,88,89,90,91				
100	68 DATA 84,85,86,87,88,89,90,91				

58	170	DATA	54,50,45,54,51,53,55	61	214	DATA	57,44,57,57,54,51,57,57	258	DATA	51,12,57,50,53,50,53
59	171	DATA	54,50,45,54,51,53,55	62	215	DATA	57,44,57,57,54,51,57,57	259	DATA	51,12,57,50,53,50,53
60	172	DATA	54,50,45,54,51,53,55	63	216	DATA	57,44,57,57,54,51,57,57	260	DATA	51,12,57,50,53,50,53
61	173	DATA	54,50,45,54,51,53,55	64	217	DATA	57,44,57,57,54,51,57,57	261	DATA	51,12,57,50,53,50,53
62	174	DATA	54,50,45,54,51,53,55	65	218	DATA	57,44,57,57,54,51,57,57	262	DATA	51,12,57,50,53,50,53
63	175	DATA	54,50,45,54,51,53,55	66	219	DATA	57,44,57,57,54,51,57,57	263	DATA	51,12,57,50,53,50,53
64	176	DATA	54,50,45,54,51,53,55	67	220	DATA	57,44,57,57,54,51,57,57	264	DATA	51,12,57,50,53,50,53
65	177	DATA	54,50,45,54,51,53,55	68	221	DATA	57,44,57,57,54,51,57,57	265	DATA	51,12,57,50,53,50,53
66	178	DATA	54,50,45,54,51,53,55	69	222	DATA	57,44,57,57,54,51,57,57	266	DATA	51,12,57,50,53,50,53
67	179	DATA	54,50,45,54,51,53,55	70	223	DATA	57,44,57,57,54,51,57,57	267	DATA	51,12,57,50,53,50,53
68	180	DATA	54,50,45,54,51,53,55	71	224	DATA	57,44,57,57,54,51,57,57	268	DATA	51,12,57,50,53,50,53
69	181	DATA	54,50,45,54,51,53,55	72	225	DATA	57,44,57,57,54,51,57,57	269	DATA	51,12,57,50,53,50,53
70	182	DATA	54,50,45,54,51,53,55	73	226	DATA	57,44,57,57,54,51,57,57	270	DATA	51,12,57,50,53,50,53
71	183	DATA	54,50,45,54,51,53,55	74	227	DATA	57,44,57,57,54,51,57,57	271	DATA	51,12,57,50,53,50,53
72	184	DATA	54,50,45,54,51,53,55	75	228	DATA	57,44,57,57,54,51,57,57	272	DATA	51,12,57,50,53,50,53
73	185	DATA	54,50,45,54,51,53,55	76	229	DATA	57,44,57,57,54,51,57,57	273	DATA	51,12,57,50,53,50,53
74	186	DATA	54,50,45,54,51,53,55	77	230	DATA	57,44,57,57,54,51,57,57	274	DATA	51,12,57,50,53,50,53
75	187	DATA	54,50,45,54,51,53,55	78	231	DATA	57,44,57,57,54,51,57,57	275	DATA	51,12,57,50,53,50,53
76	188	DATA	54,50,45,54,51,53,55	79	232	DATA	57,44,57,57,54,51,57,57	276	DATA	51,12,57,50,53,50,53
77	189	DATA	54,50,45,54,51,53,55	80	233	DATA	57,44,57,57,54,51,57,57	277	DATA	51,12,57,50,53,50,53
78	190	DATA	54,50,45,54,51,53,55	81	234	DATA	57,44,57,57,54,51,57,57	278	DATA	51,12,57,50,53,50,53
79	191	DATA	54,50,45,54,51,53,55	82	235	DATA	57,44,57,57,54,51,57,57	279	DATA	51,12,57,50,53,50,53
80	192	DATA	54,50,45,54,51,53,55	83	236	DATA	57,44,57,57,54,51,57,57	280	DATA	51,12,57,50,53,50,53
81	193	DATA	54,50,45,54,51,53,55	84	237	DATA	57,44,57,57,54,51,57,57	281	DATA	51,12,57,50,53,50,53
82	194	DATA	54,50,45,54,51,53,55	85	238	DATA	57,44,57,57,54,51,57,57	282	DATA	51,12,57,50,53,50,53
83	195	DATA	54,50,45,54,51,53,55	86	239	DATA	57,44,57,57,54,51,57,57	283	DATA	51,12,57,50,53,50,53
84	196	DATA	54,50,45,54,51,53,55	87	240	DATA	57,44,57,57,54,51,57,57	284	DATA	51,12,57,50,53,50,53
85	197	DATA	54,50,45,54,51,53,55	88	241	DATA	57,44,57,57,54,51,57,57	285	DATA	51,12,57,50,53,50,53
86	198	DATA	54,50,45,54,51,53,55	89	242	DATA	57,44,57,57,54,51,57,57	286	DATA	51,12,57,50,53,50,53
87	199	DATA	54,50,45,54,51,53,55	90	243	DATA	57,44,57,57,54,51,57,57	287	DATA	51,12,57,50,53,50,53
88	200	DATA	54,50,45,54,51,53,55	91	244	DATA	57,44,57,57,54,51,57,57	288	DATA	51,12,57,50,53,50,53
89	201	DATA	54,50,45,54,51,53,55	92	245	DATA	57,44,57,57,54,51,57,57	289	DATA	51,12,57,50,53,50,53
90	202	DATA	54,50,45,54,51,53,55	93	246	DATA	57,44,57,57,54,51,57,57	290	DATA	51,12,57,50,53,50,53
91	203	DATA	54,50,45,54,51,53,55	94	247	DATA	57,44,57,57,54,51,57,57	291	DATA	51,12,57,50,53,50,53
92	204	DATA	54,50,45,54,51,53,55	95	248	DATA	57,44,57,57,54,51,57,57	292	DATA	51,12,57,50,53,50,53
93	205	DATA	54,50,45,54,51,53,55	96	249	DATA	57,44,57,57,54,51,57,57	293	DATA	51,12,57,50,53,50,53
94	206	DATA	54,50,45,54,51,53,55	97	250	DATA	57,44,57,57,54,51,57,57	294	DATA	51,12,57,50,53,50,53
95	207	DATA	54,50,45,54,51,53,55	98	251	DATA	57,44,57,57,54,51,57,57	295	DATA	51,12,57,50,53,50,53
96	208	DATA	54,50,45,54,51,53,55	99	252	DATA	57,44,57,57,54,51,57,57	296	DATA	51,12,57,50,53,50,53
97	209	DATA	54,50,45,54,51,53,55	100	253	DATA	57,44,57,57,54,51,57,57	297	DATA	51,12,57,50,53,50,53
98	210	DATA	54,50,45,54,51,53,55					298	DATA	51,12,57,50,53,50,53
99	211	DATA	54,50,45,54,51,53,55					299	DATA	51,12,57,50,53,50,53
100	212	DATA	54,50,45,54,51,53,55					300	DATA	51,12,57,50,53,50,53

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# Stop Press



Mice, icons, pointers and menus are all part of this package. Tony Hetherington investigates the latest in desktop publishing.

*The Amx Mouse package contains a three button mouse and a disk containing Stop Press packed full of fonts and graphics that allow you to produce professional looking newspapers, posters and leaflets using your C64.*

*The package uses the Wimp system (Windows, Icons, Menus and Pointers) that was pioneered on machines like the Mac, to allow you to easily mix text in a variety of different typefaces and run it around graphic*



*shapes such as rectangles, circles and triangles as well as a*

*bewildering library of clip art. To show that the system actually works I used the package to create this article.*

*Once the program has loaded the standard Stop Press screen appears with it's work area flanked by a list of function icons and*



*below the label windows that list the available options for a selected function. For example, if you select the files function the labels windows will contain the options to LOAD either an entire page, font or cutout artwork. The work area window displays a fraction of the page that you are*



working on and can be scrolled by selecting the up or down arrow functions or can be placed in a specific area by moving the window over the preview screen of the full page.

When you've selected the area you wish to work on you can use the other functions to create, paint and fill shapes created from lines, rectangles and circles, enter text in any of the 50 different fonts supplied with Stop Press, edit your efforts by cutting, pasting and stretching any defined window and print out



a window, the screen, or the full page on a variety of supported printers.

A Stop Press page is stored on disk as a bit pattern which can cause problems particularly when your entering text. Once you've entered a line it is "written" to the page and cannot be edited as you could in a normal word processor. This is

fine if you're only writing headlines or picture captions but for a sizable block of text, such as this



article, it is best to write it on a word processor (I used PaperClip) and then load the finished document into Stop Press and onto your page.

The text to be loaded in must be stored in PET ASCII and so you should check your word processor has this option. Most do, but it's best to check before you write the text. As the text is loaded from disk it will flow onto the screen until either you pause it or it fills the work area. When it's paused you can either scroll down and restart it straight away or change the font, letter size, margins or whether the text will appear left, right or centre justified or will



*run in autoflow around any shape (Not many newspapers can do that!).*

*The text handler is only half the story as to produce a professional looking paper or leaflet it's best to mix the text with graphics that are either created by you or loaded in from Stop Press's 150k of clip art. Some examples of the animals, characters and objects included in this clip art library litter these pages as examples of how they can be mixed to produce some surprising results.*

*You can add to this library of artwork by*



*saving any defined window which could be either a graphic that you've created or an often used heading such as a newsletters title.*

*Finally, you can edit your creation by cutting and pasting blocks of it as well as magnifying any part of the page to alter a single pixel.*

*Although, Stop Press is sold with the AMX mouse it can also be used with the Commodore mouse*

*or a joystick and so Stop Press is also supplied separately at about half the standard price.*



*I have only one major criticism about the package and that involves the loading of new fonts and cut outs. These added graphics are essential but must be loaded by typing in the correct name (including capitals). There are directory options but you must then remember exactly what you want to load in. The result is somewhat unfriendly when compared to packages like Print Shop that allows you to load a clip art by selecting it from the directory.*

*Comparisons are bound to be made between Stop Press and programs such as Print Shop and Newsroom. Apart from the file handling routine I found that Stop Press offered more flexibility and variety.*

**AMX Mouse - £69.95.  
Stop Press(only)- £39.95**

# Is it the Thought that Counts?

*Does Broderbund Software's Thinking Cap idea processor offer significant advantages compared with the back of an envelope?*

*By Fin Fahey*

I have to admit to deep distrust of the "idea processor" cult - it makes the Macintosh look rational. I've seen perfectly reasonable people turned into dawning idea processors thanks simply because someone's written a few bytes of code that dignify their stray wafflings into some facade of creative thought.

I'm glad I've got that off my chest. In fact, it's really your grapes - the damn things just don't work for me. Perhaps I spend far too much time looking at a monitor screen - it's a positive relief to go off and scribble my crazed ideas on the back of bus tickets.

There also have the added advantage of being easily lovable, whereas idea processors enable you to save it all on disk, with the result that you may end up having to reread a sentence. Shoulders.

## Not so Bad Really

In fact Thinking Cap is a pleasant inoffensive little program. Honestly, I'm not incapable of admiring this sort of software - it just doesn't help me generate ideas.

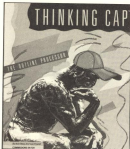
For those who haven't brushed up against the creature, an idea processor is a sort of structured notepad. It's used to set up an outline for a task such as a business plan, a speech or a magazine article.

You may enter your thoughts as topics in any order, and enter further thoughts as sub-topics of these, further ones as sub-sub-topics ad infinitum (or in this case to seven levels of depth). This means that you can start with a vague idea, and build it up as you move to deeper areas of detail. Hopefully, when you "pan back" you find that you have a coherent plan laid out.

## Friendly Facilities

Thinking Cap provides plenty of friendly facilities for helping the process along. It's pop-up menu drives, with a Help menu which smooth-scrolls beautifully up from the foot of the screen.

Broderbund ingeniously lets you use the Shift Lock to lock this in place on the screen. A full range of editing facilities is provided, including the ability to Cut, Paste and Copy from a pop-up menu.



There are two main program modes. Brainstorm is really the entry mode. Overview lets you see your ideas as a whole and allows you finer discrimination with your cutting and pasting.

Unfortunately, the program is totally keyboard-driven. This is the sort of software that I feel could benefit from mouse or joystick control, enabling you to make with the totally creative concepts while reclining languidly in your favourite armchair. Instead it's back to the dreary old function keys.

This may well be your cup of tea - after all if it makes you feel good, do it. Um - what else was I going to say? Where's that old envelope gone?

**Facilities**

**Price:** Thinking Cap. **Supplier:** Precision Software. **Machine:** C64.





## GAME OF THE MONTH

## Stiffflip &amp; Co.

*Stiffflip & Co. is a game with a difference. Have Palace Software found the magic formula to give the adventure mass appeal?*



In the Spring a young man's fancy, lightly turns to thoughts of cricket, or so the famous misquotation of Tennyson would have us believe. Palace Software have taken this theory to heart and embedded the theme deep inside Stiffflip and Co. After all is not the Orb and Scorpion of State symbolic of this most regal of national pastimes?

Although the main theme is not in the desolate atmosphere of a banana republic, the traditional atmosphere of a test match best conjures up the sense of fair play and positivity that the game demands. Well almost, in this game you must always remember that when the going gets tough, even the reflexes of a stiff lip will curl with rage.

Palace are aware that adventures rarely top the software charts. As always, shoot-em-ups and arcade machine conversions seem to dominate. As a result of this, Stiffflip has been boosted up by the addition of cartoon strip graphics and a new style of brain-teaser game to test the reaction game fans into the more cerebrally stimulating world of

adventures. For my money, they have succeeded admirably.

Viccom Sebastian Stifflip and his three comrades epitomise all the qualities that prevailed when the Raj was raging and a nation took tea and cucumber sandwiches while awaiting the second innings of the World War. Beneath the veneer of sophisticated veneer there were starrings in the Republic of Barataria. Count Chambliss was the head of a design dictatorship which he described in the following way: "when as peoples ask for or right to vote, my answer is: be quiet!"

Dissatisfied with a mere corner of the globe, Chambliss had a masterpiece which would cause the total downfall and capitulation of the British Empire. His scientists were close to completion of a rayon which would cause the world's trouble at its sheer simplicity. No, not the feared Radio Raygun of the SNAFU Corporation but the Rubberball Raygun which would restrain the starch in wingtips and stiff upper lips, weaken moral fibres and, worst of all

seriously affect the honour of a cricket ball.

Stiffup's suspicions were aroused when the entire rubber crop of Banania went missing and we join his team at Banania's airport where they are greeted by General Monomadic with a demand for airport tax. This is the point at which you learn how easily the locals can be misled as the screen is peppered with insults to such incorrect response to the General's demands. Eventually, you find the correct trigger and the adventure begins.

After a little searching you find several useful locations, not least of which is the local bar. The bartender is not very helpful but once you solve a fairly weighty problem he will help you all he can.

Each of the main characters can interact with the game by an ingenious icon system. To change the person currently under control you use the 'While...' icon. This causes a 'Meanwhile' caption to appear and the selected team member appears in the location where you last left them. The



character can now be moved using a single pop-up icon menu or one of a multitude of actions may be performed.

The scenery is teeming with Chameleons's henchmen who seem to have a grudge against foreigners. These mindboggled mental pigmies wander from location to location and will block the unfortunate team member who crosses their path. If the character concerned is not under your immediate control, the relevant character icon gains a speech bubble with a plus for help. Speed is of the essence if the victim is to be saved. Quickly selecting that character you can swing into 'flit' mode and the fight screen appears.

There are several elements to a fight but the first decision is whether to continue or accept the white feather of a retreat and head for a safer place. It would be foolish to flee and the best option is to attack they using one of the other three options. The most effective of these is a quick jab below the belt but this is the mark of a bruiser and can only be resorted to three times before the colossal swampy steps in and sends your character back to the great garrison in the city.

This times the right approach and left hook as the only self-defence. In both cases the power and accuracy of the punch is measured in the same way. A rotating boxing glove probably increases its speed and power as you concentrate on keeping an erratically moving cross in the centre of the targeting screen. When you're up to it a quick press on

the fire button releases an arrow which flies into the target and the blow is landed. The effectiveness is measured on a fatground style 'Test Your Strength' icon at the top left of the screen.

Of course your opponent doesn't take this lying down. You have to watch the right hand side of the screen where the henchman's reaction is most torrid. As you concentrate on whacking him with the hardest punch you can muster, a boxing glove on a spring balance even moves to the crucial contact point. If the blow is landed before you can react, the punch is registered on your diminishing strength scale and you have to start building up your shored punch from scratch.

Apart from indulging in Bananitis, Stiffup and Co. will meet many complex and subtle problems in their search for Chameleons. Each person has special capabilities which means working out who has the sharpest nails for any given rages, who has specialist skills with equipment and who possesses the necessary tools for the job in hand.

Vicount Stiffup is the team leader through his military record shows him to be a devoted warrior. The Germans had von Richthofen - so had his counterpart Stiffup, the Yellow Baron.

Link is brother of the second member of the team, Colonel R. G. Bungle. It is rumoured that the warthe recipient of the noble order of the G.I.T. on many occasions when he was killed to the Bat. He is also renowned for his belief that a salary provides a means to live beyond, and consequently his checkbooks are now printed on recycled paper.

The only female agent is Palenra Pimbenbom who's not as straightforward as she may sound. Her experiences in the Cull Guides was good preparation for her later work with the savage tribes of Darkest Sarney. Palenra is a tough customer but she never forgets her distinguished performance in the Guides where she survived the grueling department classes to become the first non-posthumous recipient of an achievement badge.

Professor Braindeath's achievements in the field of amnesia research were long forgotten when he started researching into producing a device to put the middle back into doughnuts. For the moment the work has been abandoned in favour of the Bananian expedition's promise of thrills, excitement and lots of war. The professor's main claim to fame is that he has been clinically dead for the past ten years.

Palenra have taken great pains to make this an adventure with a very broad appeal. It was backed from the beginning but only time will tell if they've been caught in the slip or if they've succeeded in making a good contact across the boundary of conventional adventure. Perhaps their intention there through in three releases of Barbarian - the Ultimate Warrior which lacks any kind of lasting interest but has an immediate, if broad, appeal. Watch the domain of Barbarian but come home with Stiffup and Co. - the very best of British ingenuity and programming.

#### Teachings

Enter Stiffup & Co. Supplier: Palenra Software, 215 Penryn Road, London N1 6AL. Tel: 01-258 8731.

Uniqueness: 10/10. Playability: 8/10. Graphics: 8/10. Value: 8/10.

# Screen Dump 64

*It's always useful to be able to get a hard copy of your on-screen masterpiece. Our Screen Dump program, gives you the opportunity to do just that.*

*By John Fletcher*

A screen dump facility is an exceptionally useful asset to any computer. This simple and easy to use program will add this capability to your Commodore 64/128.

This utility can be used within a Basic program or can be loaded in whenever you need it.

## Using the Program

When you wish to run Screen Dump 64, there are two parameters which must be entered.

The first is the starting point of your hi-res screen (usually 8192/8200), a number between zero and 65535 can be entered.

The second parameter is the inverse flag. If you enter zero then the picture will be in normal mode. Any number above zero and below 255 will set the picture in inverse mode.

For example, if you wish to dump a picture at memory location 24576 (60000) in normal mode, then you

should type in the following:

```
SYS 49152,24576,0
```

Always switch the printer off and on again before running Screen Dump 64 to clear the buffer. After printing, the cursor will appear. At this point, press RUN/STOP and Restore.

When the screen dump is running, the screen will begin to flash. After this, the printer will start.

## Demo Program

Included with the Screen Dump is a demonstration program which will draw a 3D perspective shape and dump it to the printer after it has been drawn.

Another handy routine is also included with the demo which will clear 32 pages of memory i.e. a hi-res screen. Instead of waiting for Basic to do this (which takes two or three minutes) this routine will do the job in

a split second.

One parameter is needed for this routine which again is the starting point of the hi-res screen.

For example, to clear a hi-res screen starting at 8192 (82000) use:

```
SYS 80000,8192
```

## Tips

If you wish to dump a character set to the printer and then load your characters into memory at, for instance, 12288(52000), then type:

```
SYS 49152,12288,0
```

Screen Dump 64 is meant to dump a hi-res image screen to the printer, but if you choose your colours carefully, it is possible to dump multi-colour screens to the printer, giving three shades of grey.

If you wish to stop the screen dump at any time press RUN/STOP and Restore. 

### PROGRAM: CLEAR.Loader

00 2 REM *****	40 2 REM * CLEAR ROUTINE INTO H	*****
*****	OSRT.	
10 2 REM * 0410 PROGRAM FOR T	01 2 REM *****	00 10 BL=2 :GB=00 :DA=5000
BU 01-002 *		0



```

38 30 FOR L=0 TO 81:GOTO 31FOR D=
  0 TO 10:READ A:CH=CHR$(A)
  81:PRINT D:GOTO 31
39 30 READ A:IF A=0 THENPRINT
  "ERROR IN LINE":GOTO 31:GOTO 31

```

```

40 40 NEXT L:GOTO
  39
41 50 DATA 30,250,170,31,130,17
  0,31,267,340,185,20,130,250,
  185,31,130,2150

```

```

42 60 DATA 210,340,0,180,30,180
  0,180,250,180,300,230,230,0
  1,230,250,170
43 70 DATA 340,0,0,0,0,0,0,0,0,0,
  0,0,0,0,0,0,0,240

```

## PROGRAM: SCREEN BUMP LOAD

```

44 1 REM *****
  *****
45 2 REM " THIS PROGRAM PUNCH T
  HE CODE "
46 3 REM " FOR THE C64 SCREEN B
  UMP PAGE "
47 4 REM " 1870 MEMBERS.
  "
48 5 REM *****
  *****
49 10 81:81 (L=0) (81-1)
50 20 FOR L=0 TO 81:GOTO 31FOR D=
  0 TO 10:READ A:CH=CHR$(A)
  81:PRINT D:GOTO 31
51 30 READ A:IF A=0 THENPRINT
  "ERROR IN LINE":GOTO 31:GOTO 31
52 40 NEXT L:GOTO
  39
53 50 DATA 30,250,170,31,130,17
  0,31,267,340,185,20,130,250,
  185,31,130,2150
54 60 DATA 210,340,0,180,30,180
  0,180,250,180,300,230,230,0
  1,230,250,170
55 70 DATA 340,0,0,0,0,0,0,0,0,0,
  0,0,0,0,0,0,0,240
56 80 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
57 90 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
58 100 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
59 110 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
60 120 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240

```

```

52 130 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
53 140 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
54 150 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
55 160 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
56 170 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
57 180 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
58 190 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
59 200 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240
60 210 DATA 130,250,180,30,130,
  250,180,300,230,230,0,0,0,0,0,
  0,0,0,0,0,0,0,240

```

```

47 120 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
48 130 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
49 140 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
50 150 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
51 160 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
52 170 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
53 180 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
54 190 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
55 200 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
56 210 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
57 220 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
58 230 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
59 240 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240
60 250 DATA 180,130,250,180,30,
  130,250,180,300,230,230,0,0,0,
  0,0,0,0,0,0,0,240

```

## PROGRAM: SEND PAGE

```

44 100 PRINT "C64"
45 110 PRINT "SEND PAGE"
46 120 PRINT "SEND PAGE"
47 130 PRINT "SEND PAGE"
48 140 PRINT "SEND PAGE"
49 150 PRINT "SEND PAGE"
50 160 PRINT "SEND PAGE"
51 170 PRINT "SEND PAGE"
52 180 PRINT "SEND PAGE"
53 190 PRINT "SEND PAGE"
54 200 PRINT "SEND PAGE"
55 210 PRINT "SEND PAGE"
56 220 PRINT "SEND PAGE"
57 230 PRINT "SEND PAGE"
58 240 PRINT "SEND PAGE"
59 250 PRINT "SEND PAGE"
60 260 PRINT "SEND PAGE"
61 270 PRINT "SEND PAGE"
62 280 PRINT "SEND PAGE"
63 290 PRINT "SEND PAGE"
64 300 PRINT "SEND PAGE"
65 310 PRINT "SEND PAGE"
66 320 PRINT "SEND PAGE"
67 330 PRINT "SEND PAGE"
68 340 PRINT "SEND PAGE"
69 350 PRINT "SEND PAGE"
70 360 PRINT "SEND PAGE"
71 370 PRINT "SEND PAGE"
72 380 PRINT "SEND PAGE"
73 390 PRINT "SEND PAGE"
74 400 PRINT "SEND PAGE"
75 410 PRINT "SEND PAGE"
76 420 PRINT "SEND PAGE"
77 430 PRINT "SEND PAGE"
78 440 PRINT "SEND PAGE"
79 450 PRINT "SEND PAGE"
80 460 PRINT "SEND PAGE"
81 470 PRINT "SEND PAGE"
82 480 PRINT "SEND PAGE"
83 490 PRINT "SEND PAGE"
84 500 PRINT "SEND PAGE"
85 510 PRINT "SEND PAGE"
86 520 PRINT "SEND PAGE"
87 530 PRINT "SEND PAGE"
88 540 PRINT "SEND PAGE"
89 550 PRINT "SEND PAGE"
90 560 PRINT "SEND PAGE"
91 570 PRINT "SEND PAGE"
92 580 PRINT "SEND PAGE"
93 590 PRINT "SEND PAGE"
94 600 PRINT "SEND PAGE"
95 610 PRINT "SEND PAGE"
96 620 PRINT "SEND PAGE"
97 630 PRINT "SEND PAGE"
98 640 PRINT "SEND PAGE"
99 650 PRINT "SEND PAGE"
100 660 PRINT "SEND PAGE"

```

```

44 290 REM *****
  *****
45 300 REM *****
  *****
46 310 REM *****
  *****
47 320 REM *****
  *****
48 330 REM *****
  *****
49 340 REM *****
  *****
50 350 REM *****
  *****
51 360 REM *****
  *****
52 370 REM *****
  *****
53 380 REM *****
  *****
54 390 REM *****
  *****
55 400 REM *****
  *****
56 410 REM *****
  *****
57 420 REM *****
  *****
58 430 REM *****
  *****
59 440 REM *****
  *****
60 450 REM *****
  *****
61 460 REM *****
  *****
62 470 REM *****
  *****
63 480 REM *****
  *****
64 490 REM *****
  *****
65 500 REM *****
  *****
66 510 REM *****
  *****
67 520 REM *****
  *****
68 530 REM *****
  *****
69 540 REM *****
  *****
70 550 REM *****
  *****
71 560 REM *****
  *****
72 570 REM *****
  *****
73 580 REM *****
  *****
74 590 REM *****
  *****
75 600 REM *****
  *****
76 610 REM *****
  *****
77 620 REM *****
  *****
78 630 REM *****
  *****
79 640 REM *****
  *****
80 650 REM *****
  *****
81 660 REM *****
  *****
82 670 REM *****
  *****
83 680 REM *****
  *****
84 690 REM *****
  *****
85 700 REM *****
  *****
86 710 REM *****
  *****
87 720 REM *****
  *****
88 730 REM *****
  *****
89 740 REM *****
  *****
90 750 REM *****
  *****
91 760 REM *****
  *****
92 770 REM *****
  *****
93 780 REM *****
  *****
94 790 REM *****
  *****
95 800 REM *****
  *****
96 810 REM *****
  *****
97 820 REM *****
  *****
98 830 REM *****
  *****
99 840 REM *****
  *****
100 850 REM *****
  *****

```

```

47 470 REM *****
  *****
48 480 REM *****
  *****
49 490 REM *****
  *****
50 500 REM *****
  *****
51 510 REM *****
  *****
52 520 REM *****
  *****
53 530 REM *****
  *****
54 540 REM *****
  *****
55 550 REM *****
  *****
56 560 REM *****
  *****
57 570 REM *****
  *****
58 580 REM *****
  *****
59 590 REM *****
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60 600 REM *****
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61 610 REM *****
  *****
62 620 REM *****
  *****
63 630 REM *****
  *****
64 640 REM *****
  *****
65 650 REM *****
  *****
66 660 REM *****
  *****
67 670 REM *****
  *****
68 680 REM *****
  *****
69 690 REM *****
  *****
70 700 REM *****
  *****
71 710 REM *****
  *****
72 720 REM *****
  *****
73 730 REM *****
  *****
74 740 REM *****
  *****
75 750 REM *****
  *****
76 760 REM *****
  *****
77 770 REM *****
  *****
78 780 REM *****
  *****
79 790 REM *****
  *****
80 800 REM *****
  *****
81 810 REM *****
  *****
82 820 REM *****
  *****
83 830 REM *****
  *****
84 840 REM *****
  *****
85 850 REM *****
  *****
86 860 REM *****
  *****
87 870 REM *****
  *****
88 880 REM *****
  *****
89 890 REM *****
  *****
90 900 REM *****
  *****
91 910 REM *****
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92 920 REM *****
  *****
93 930 REM *****
  *****
94 940 REM *****
  *****
95 950 REM *****
  *****
96 960 REM *****
  *****
97 970 REM *****
  *****
98 980 REM *****
  *****
99 990 REM *****
  *****
100 1000 REM *****
  *****

```

**T**he Amiga A500 will certainly put the cat amongst the pigeons in the A6000 market. It's rather like a Rotho Rover being offered at a price slightly higher than the average family saloon. At £499 + VAT, the Amiga now competes favourably with the top end of the present home computer market. The only obstacle is the Atari ST and whether the home buyer will go for a saving of around £100. In many ways the Amiga is superior to the ST but, will people look beyond the price tag?

So, what do you get for your money? The A500 is an Amiga—every sense and the inclusion of the boot program, Kickstart, in the ROM saves a few of the scripping headaches which were part and parcel of the earlier A1000. A few more of the teething troubles inherent with the Workbench software have also been ironed out with Workbench II.

The amazing thing about A500 is its size and weight. Considering there is a built in disk drive, it is still a very light unit and takes up just slightly more space on my workstation than the C128. The finish is the new starburst cream coloured plastic which seems to be Commodore's industry standard. At least this encourages cleanliness because the finish really does show every speck of grime.

### Con-down

Although the Amiga is at a cut-down price, there are no compromises on the features offered in the Amiga standard as set up by the A1000. I have tried every bit of software in hand and so far nothing has failed to load. Perhaps its time that software houses started to indicate memory requirements for their products because the future will bring bigger and better products which may not fit into the standard memory.

The rear of the machine is reserved for input and output ports. The only colour video output is for RGB monitors but a monochrome composite output has been tapped off for those who intend to use it for text based businessware on a green screen VDU. This is rather like running the aforementioned Rotho Rover on paraffin but a useful stopgap if funds don't immediately stretch to a new monitor. There is a RF unit available to allow the use of the machine with a domestic TV set but, as with all 88

# Affordable



# leAmigas

*Is it the ultimate machine  
for the ultimate price?*

*By Eric Doyle*



columns systems, this is not the recommended method of viewing the Amiga and is only provided because of public demand for such enhancements.

Up to four external disk drives can be controlled via the single disk output port. As with all Commodore drives, they are not the fastest of units and do tend to emit worrying grinding noises. One advantage of external drives is that you can take advantage of emulators (CP/M, PC-DOS etc). You are then free to use drives other than the usual 3.5 inch drives but I could find no simple way to select an external drive as the main drive which could give problems with some commercial software.

Printers, modems and all of the other paraphernalia of hi-tech living can be connected to either the parallel or serial connectors. As the range of add-ons increases I hope some enterprising outfit produce a motherboard to prevent all of the plugging and unplugging which I foresee in future years.

## Sound Capabilities

The Amiga's sound capabilities are first class and a MIDI interface will mean that the portable A500 may well be appearing on Top of the Pops before too long. To ensure the best fidelity there is a pair of stereo output sockets which can either connect to a stereo monitor or plug directly into your music system for even higher fidelity.

The final ports are possibly the ones which will take the heaviest wear and tear: the control ports. This is where trackballs, mouses and joysticks can be connected. There are two ports available which resemble the ports on the humble C64 so there will be no shortage of choice when selecting your control devices. The A500 package includes a mouse which is essential for interacting with the intuition operating system.

We have been praising the abilities of the Amiga in Your Amiga, our bi-monthly magazine within a magazine, so I recommend that you brush up on your back issues for greater detail. The first package I would recommend is Deluxe Paint II which will show off the graphics capability of your new machine to full advantage as well as providing hours of enjoyment. This must be the best art program currently available.



### Prices

The subject of software prices is also one to be considered. Most packages cost in excess of £20 which is not cheap though you do get your money's worth in terms of software development time. The big problem is that the software should not be bought 'blind'. At the moment most retailers are more than happy to give demonstrations but will this be the case as the Amiga becomes part of the furniture in more and more homes? Your Amiga will point you in the right direction but hands on experience is the greatest recommendation that a package can get so now is the time to behold a loyal retailer.

Budget companies like Martinware, Code Masters and Firebird are waiting in the wings and there are strong rumours of games at £8. This would provide a fantastic boost to the hardware sales for home use. After all, what use is a state-of-the-art computer

at a popular price if the software is prohibitively expensive?

### Big Question

The big question which everyone is asking is, 'Will the Amiga become the Spectrum of the 16 bit era or will the ST take the launch.'

Certainly, the Atari ST has a slight advantage of price but what it lacks is the mouse chip. Well, there are the compromise blitter based Mega ST's appearing but the price will certainly equal, and probably exceed that of the A500. This is the coin of the market on the technical side. Ask any of the big names in programming and they will say that the Amiga opens up opportunities which the ST can only dream of. Atari seem to have more than their fair share of the popular press at the moment but I predict that by Christmas Amiga will be the word on everyone's lips.

A lot depends on pricing. The standard ST has the edge at the moment but the new head of Commodore UK has a positive attitude towards machine costing. Already there is talk of reducing the price of the C64 and I would not be surprised if a 66000 price war is declared between Atari and Commodore in the run up to the Christmas buying bonanza. A price tag of a meagre £380 could fall a little further but will Commodore risk opening retailers by reducing their profits?

The battle is for the 16 bit market and whoever gets their foot firmly in the door will benefit greatly from future benefits.

Even *Amiga* makes this with their risky 16 bit project. The *Amiga*/Commodore find will be a hard fought battle but the Amiga is still THE machine and should win on more but is this enough? I hope so. W



# The ICPUG Column

*We present the first column in a regular series by  
ICPUG - Britain's biggest independent Commodore user  
group.*

*By Tim Arnot*

Since this is the first ICPUG column to appear in *Your Commodore*, it might be a good idea to start off by introducing ourselves. ICPUG (pronounced 'ickpug') is an acronym for the Independent Commodore Products Users Group. With me shall I? Good. Hands up here if you who have seen our adverts in this and previous issues. Even better! Splendid! I am almost tempted not to say any more about ourselves, but as one Mr Spock so neatly once said 'The ignorance of the few outweighs the needs of the many.' So put your hands down, get comfortable, and I'll begin.

## How It all Began

ICPUG started out back in the dim mists of time when computers were big, drives were rare and £K was a lot of money! In those days (1979 actually) £100 would just about buy an 8K PET with built-in cassette (see, Arnost had nothing new there) and a 9" integral monitor. Some people in the south east corner of England got together

and formed the Independent PET User Group (IPUG), life was rosy, the group flourished and it had about 400 members.

Gradually, PETs got bigger. 8K gave way to 16K, which gave way in turn to 32K. Basic 2.0 was replaced by Basic 4.0. Then PETs got faster, developed a business keyboard and 80 column screen, got bigger again, memory soared to a massive 96K through the innovative technique of bank switching.

In 1982 a new computer arrived on the scene. It had a massive 35K of memory, the phenomenal and unsurpassed Basic 2.0 and a huge 22 column screen. But it was in colour, and for a mere £289 it was a bargain. Yes, the VIC-20 was born. A year later and Commodore tried again, producing the best-selling 64. It had a 40 column screen, the same archaic Basic 2.0, high resolution graphics and sound that nobody could get at, but nearly 3 years later, and after one face lift, it is still one of the best 8-bit computers around.

## Where We Came In

ICPUG had a problem. Membership was now in the thousands, but the vast majority had VICs and 64s - not PETs. So a change of name was in order, and 'PET' was dropped in favour of 'Commodore Products' (broadly, ICPUG in Canada, of which Jon Butterfield is a founding member, has stuck with the PET label throughout their history). ICPUG was born.

After that, Jack Tramiel left Commodore to buy Atari, and in his passing shot, launched the Plus/4 and C-16 into the world. The following year, in a desperate bid to make up for this disaster, Commodore finally brought out the machine it had originally intended to launch before - namely the 128.

During the bad times of 1985, employees left Commodore like rats from a sinking ship (except that rats usually leave voluntarily), and more than one manufacturing plant was closed down. Rumour and counter-

rumour abounded: new machines; chapter II (bankruptcy to us non-Americans)...until finally the revolutionary Amiga 500 arrived. A business computer that business didn't want and enthusiasts couldn't afford, but the potential was enormous. Commodore didn't go bust, although the Amiga had fierce competition in the form of the already available and cheaper Atari ST. And now? More Amigas and boards of even cheaper SAs. The war continues.

### From Strength to Strength

But what of ICPUG? Throughout this, ICPUG has just grown and grown, and this year, membership is expected to exceed the 4000 mark for the first time ever. For the statistically curious, that makes ICPUG the largest wholly-anonymous organisation in Europe. And with an annual turnover exceeding £50,000, it is not surprising that last year we elected to become a limited

liability co-operative. Yes, folks, the name has changed yet again, and ICPUG became KCPUL - mainly thanks to some obscure law that says a 'group' must be a group of companies. However we still trade under the name ICPUG.

Why the success? Well, our membership is based firmly on serious users' rather than 'games players' (not that we are averse to playing the odd game - far from it). Our newsletter ('journal' really since it contains a similar amount of text to *Your Commodore*) is one of the most authoritative documents available on Commodore machines. It has been said that ICPUG reads to technical information like a horoscopes reads to trends.

This is undoubtedly true, and is a major reason for our success. Why? Because Commodore in their infinite wisdom have chosen to shed 99% of their technical staff, and now we are the only people who know anything about what they sell. So when Jon

Parker phones Commodore with a query, who does he get put onto? That's right - us!

### Joining Up

So, now you know who we are and why we are here. If you want to join, check out the advertisement elsewhere in this issue. If not, I'll just leave you with the thought that it was probably the best £11 you would have spent (if I didn't get around to saying who I am and how come I'm writing this - such is life). Next time, Jim Hatfield and we get on at the Commodore show.

See you on the bit stream.

For more information on KCPUL contact:

Jack B. Cohen  
Membership Secretary,  
38 Brammer Road,  
Newbury Park,  
Hemel,  
Herts RG2 7EP  
One year's subscription to  
ICPUG: £8.

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# Thing Bounces Back



*Your chance to win one of 20 copies of the long awaited  
Thing Bounces Back from Gormin Graphics.*

**H**aving dealt finally with the evil toy goblin in Thing on a Spring, Thing must take up his second challenge and halt production of evil toys in the factory. To do this he must collect parts of a program that are scattered around the factory in order to reprogram the factory computer.

Twenty copies of Thing Bounces Back are up for grabs in this month's competition. Just find the differences and a copy of the program could be bouncing its way to you.

## How to Enter

Study the two cartoons, there are a number of differences between them. Once you have decided how many differences there are complete the entry coupon and send it to the editorial address (see below). Please write the number of differences that you have found on the back of the envelope. If you don't then your entry will not be accepted.

## The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Gormin Graphics Software. This restriction also applies to employees' families and agents of the companies.

The How to Enter section forms part of the rules. The Editor's decision is final and no correspondence will be entered into.



## Thing Competition

### Entry Coupon

Name .....

Address .....

Postcode .....

Number of differences found .....

Post to: Four Commodore, Thing Competition, 1 Golden Square, London W1R 3AR. Closing date: Friday, 20th August, 1987.



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and the following are the results of the regression analysis:

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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Activity	Location	Frequency	Duration
Activity 1: Introduction to the course	Online	Once	10 min
Activity 2: Understanding the importance of the course	Online	Once	10 min
Activity 3: Understanding the importance of the course	Online	Once	10 min
Activity 4: Understanding the importance of the course	Online	Once	10 min
Activity 5: Understanding the importance of the course	Online	Once	10 min
Activity 6: Understanding the importance of the course	Online	Once	10 min
Activity 7: Understanding the importance of the course	Online	Once	10 min
Activity 8: Understanding the importance of the course	Online	Once	10 min
Activity 9: Understanding the importance of the course	Online	Once	10 min
Activity 10: Understanding the importance of the course	Online	Once	10 min

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The last sentence of the paper is the simple, imperative command: "Rationalize, rationalize, rationalize, rationalize!" (Emphasis added.)

**Table 1**

[illegible]

**Abstract**

**date**  
electronics

1. The first step is to identify the problem. This involves understanding the symptoms and the context in which they are occurring.

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# Contributions

*So you own a Commodore? So you've written some programs? So why haven't you sent them to us?*

**Y**our Commodore is always on the look out for new programs, hints and tips, articles and even regular series. In fact if you have something that you think could be of use to other Commodore owners we want to hear about it.

So if you have got something which you think we may be interested in, how do you go about submitting it to us?

Below you will find a list of guidelines that will help us to deal with any item that you send in to us. We don't expect everybody to be the next William Shakespeare but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced i.e. there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:

Name of the article  
Machine that it is for  
Any extra required - disk, printer etc.

Your name  
Your address  
Your telephone number

4) The top of every page should have the following information on it:  
Abbreviation of the article title  
Your name  
The page number

For example, suppose you had submitted an article on C64 interrupts. You should put something like the following at the head of the page:

Interrupts/J.Smith/1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English, it does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word **WORD** if there are more pages to the article or **ENDS** if it is the last page.

8) If possible, enclose a listing of all programs.

9) Under no circumstances are a staple to hold the pages together. Use a paperclip instead.

10) Programs should be included on either disk or tape. Make sure that you **SAVE** two copies of every program so that we have a better chance of loading them if problems occur.

11) Programs under 10 lines can be included in the text. If your program is longer than this you must enclose a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs, if necessary, must be either black and white prints or colour slides. We can take shots ourselves so don't worry about this too much.

14) Submissions of any length are welcome. If you have a line item routine that you think may be of use to someone else we welcome it just as much as a full blown six part series.

15) Payment varies quite a lot and depends on quite a number of factors, such as complexity of program, presentation of program, number of magazine pages it takes up etc. Payment is generally between £10.00 and £100.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the terms of publication, the rate of payment and an agreement form. Prompt return of this form will allow us to use your program as soon as possible.

18) If you want the program returning to you, should we find it unsuitable for publication, then you should enclose a stamped self addressed envelope.

19) The last and most important point to make is 'get writing', we are waiting for your articles.





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# Knowledge Made Simple?

*XPER is a new package that finally brings the Expert System to the C64. Can it do anything for you?*

*By Fin Fahey*

**X**PER from Adams Software, is an 'Expert System', aka 'Knowledge-Based System', aka a 'Michie' — named after the developer and guru of Knowledge Engineering, Donald Michie. It claims to be the first of its kind available for the humble Commodore, but how useful will it be?

It is at least pleasant for C64/128 owners to be let in on such a widely-respected form of software. Knowledge Engineering swings in and out of fashion and seems to engender passionately partisan reactions.

Readers of the New Scientist may have noticed that monthly journal is in the throes of backlash against the whole idea. Considering the extravagant claims made by some of the most wild-eyed advocates of KBEs, this is at least understandable.

## What Is It?

So what is an Expert System and why the fuss? Well, in a sense it's a response to the usual world shortage of experts, of educators more? Too simple... Just as an industrial robot is a device to replace, replicate, and store the manual skills of the assembly-line or craft worker, so the Expert System seeks to do the same for some intellectual skills — those we generally think of as knowledge.

Any such system, such as XPER, holds knowledge in the form of a set of 'learned' rules — the knowledge base or outer abstracts these and from their own fields of study or experience. The simplest example, which Adams use in their sample XPER knowledge base, may be that of zoology.

## Playing by the Rules

A trained zoologist will immediately be able to identify an unknown animal by applying a series of classificatory rules based on its appearance, behaviour or whatever. As these rules are applied one by one, the number of alternatives is

narrowed, eventually, with luck, to just one.

Which may seem obvious — after all, it's what many of us do all the time, for example while diagnosing a car fault, or debugging a program — "It's not this — so it must be that..."

The point, though, of the Expert System is that it may remember rules no one else's memory, so it's just like having an unpaid expert on top of the data. Which is a prospect that makes some experts, understandably, nervous.

## Great XPEctations

So is XPER. XPER is definitely not expert itself. In fact, it's a device for setting up expert systems, which of course, will only be as good as the knowledge you've filled them with. You can think of it as a sort of structured database system. The designers haven't created any features, having included all sorts of ways for you to get at your knowledge.

They've also made the program about as user-friendly as a hell-raised dog on a leash. There is some excuse for this, since this sort of system is usually seen on mainframe computers, for a big machine environment, one of us is positively bemused on.

XPER does have help menus. The first thing to do is accessing one of these is to reach for the manual to get some help interpreting the help. On doing this, you are faced with grids of English prose such as: "One or more animals may define the relation between the feature and the object, which is the intersection of a feature and an object". Adams have also invented the novel new verb 'inquiring'.

## But...

But, just to be repeated, in the end I find this to be a good solid piece of software underneath. In some ways it makes a





change from systems that are all friendliness and no substance.

The user should be warned however that there's a lot of undergrowth to hack through first before getting any results.

Which brings us to what do you use XPER-powered systems for? Apparently the package has already been used to set up knowledge bases in fields as various as tree identification, animal classification and car fault diagnosis, so if you have a special need there may be a system out there for you.

Alternatively, if you possess a priceless fund of hand-gleaned knowledge, the scope is there for you to create a lucrative option of your own — provided your skill is in demand.

And there's one final use — as a fine introduction to the Knowledge-Based Systems. If it were so important, XPER would be a valuable piece of educational software.

In conclusion, this is an admirable piece of software let down by its own user-hostility. It's worth buying out of sheer curiosity, but if you're strapped for cash, consider carefully whether you need an Expert system, much as you might worry over buying an Accounts package.

*Tim Wiles*

*Title: Xper. Machine: C64/128. Supplier: Abacus Software.*

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# WHODUNNITS

*If you're a supersleuth on the trail of murder, mystery and suspense - then look no further than your C64. We've rounded up a collection of cases to challenge the digital detective.*

*By Tony Hetherington*

The software houses have been remarkably slow to get on the trail and for years there were only a handful of adventure-style detective mysteries to solve, such as *Sherlock* (Melbourne House) which was a spin-off from *The Hobbit*. Suddenly, that has all changed with a surge of sleuthing software that's as varied as the victims.

## Killed Until Dead

**Supplier:** Avalon (US Gold)

**Price:** £19.99 (Cassette)



Last month's game of the month poses one of the toughest challenges to would-be hotel detectives - it begins as the *Midnight Murder Club* book-in, five fictional crime writers aim to turn their fictitious plots into real in order as they each stake their claim to be the world's greatest murderer!

By using your joystick-controlled files, surveillance cameras, notes and less subtle break-ins you aim to track down the killer before he or she strikes at midnight. Despite the simplicity of the game system each of the twenty-one cases is packed with mystery, intrigue, red herrings, twists and surprises that ensure you'll try and complete them all.

## Deadline

**Supplier:** Delphine (Activision)

**Price:** £19.99 (Disk only)



Marshall Robner is found dead inside a locked library. Beside him are his tablets - he was taking them for depression. The autopsy shows he died from an overdose. The police think it's an open-and-shut case of suicide but Robner's lawyer isn't convinced and has called you in to investigate.

When you open up the case file (game box) you find transcripts of the police interviews with the main suspects, a copy of the post mortem, a photograph of the scene of the crime and even a sample of tablets. This is typical of the quality of Infocom adventures in which you get absorbed in the atmosphere of the game even before you load it in.

Once the disk is loaded you have just twelve hours to solve the crime (if there was one) by sifting through the evidence, searching the massive house, questioning the suspects, deciding the importance of mysterious phone calls to the widow and gambling debts owed by the son and, of course, there's the will that was to be changed the very next day...

Every clue, suspect, and situation is described in incredible prose that defies the inclusion of graphics. But the reward—solving the murder before the Deadline—is an almost impossible task.

Deadline is one of a hat-trick of Infocom mysteries that also includes Witness. Witness is set in the 1930s—you're a reporter at a society masquerade ball and the hostess is found strangled and you become a Suspect.

## Vera Case

Supplier: Infocom

Price: \$9.95 (Acorn) \$14.95 (Disk)



The Vera Case affair gives you the chance to sign up for the French police force and investigate the shooting of known prostitute Vera Case. She was found in a pool of blood next to a suicide note, but you're once again convinced that it's a murder.

The game aims to be an accurate representation of a murder investigation and is played in two parts. In part one you must search the scene of the crime for minute clues by moving a cursor across the scene. If you find anything interesting then you'll get a close-up view and should make a note in your notebook. Armed with these invaluable clues you return to your office to combine your investigation using the Silver's crime-fighting computer.

In part two you use computers to send messages to other police forces to check the records for suspects, track down car owners and to find out about past or present prison denizens. You can also order an autopsy and give a statement from anyone as long as you have their name and address. Statements can then be compared with evidence.

Gradually you will begin to widen your knowledge about the life of poor Vera Case and her friends and gimps. Next, you'll have to sort out facts from lies and inevitable red herrings until finally, in your best French accent, you can solve the murder.

The same game system is used in the sequel The Sydney Affair. In this, you must discover why an (unhappy) married man with two children was gunned down with a high-powered rifle and, of course, who did it.

## Murder on the Atlantic

Supplier: Infocom

Price: \$19.95 (Acorn) \$14.95 (Disk)



Infocom's third murder mystery shows a complete change in style and gameplay and features a murder on the liner Le Rougier during a voyage in the tension-filled pre-war years of the 1930s.

Inside an Infocom-style packed box you'll find the game tape or disk nestled among telegrams, letters in French, German, English and Italian, as well as photographs, secret plans, negatives, passenger lists, a newspaper, a report from the security officer, mail notes, a capsule of ink, business cards, a piece of string and a spent gun cartridge.

Unfortunately, having all this evidence at your fingertips doesn't make the game any easier and will only confuse you if you try and look at it before you begin the game. Instead you should start with a room-by-room search of the ship, examine everything, question everybody and collect all the evidence. Then save the game before sifting through what you've got and the copious notes you've undoubtedly made about the forty main suspects. Only then will you understand the next stage and be close to deciphering the web of intrigue on a ship full of spies, secret assignments and marked trails.

Once you think you've solved the crime you can head in a separate test program that will help you check your facts but will probably leave you with more questions than answers.

## The Detective

Supplier: Argus Press Software

Price: \$8.95 (Acorn)

The Detective is a joystick-controlled, icon-driven murder inquiry in which you play Inspector Snide (of The Yards in his investigation of the murder of Argus Macchugus. The mystery begins with an anonymous phone call that goes simply: "MacFergus has kicked it—" this leaves you with a car and no clues. Your only chance is to go to the



May Fungus mansions and solve the mystery before the killer strikes again.

The mansion isn't an easy place to solve a murder as it's riddled with secret passageways and packed with suspicious characters such as a butler, a mad professor, the cook, a maid and an arrogant daughter.

Simple, yet rich controls move you around the mansion and its many rooms. These are packed with objects to examine and use as well as food to eat, documents to read, and suspects to question. It's all done by pointing to the items that appear at the bottom of the screen. By connecting the game's characters you can question them about the deceased Angus MacFarlane, other characters and any objects you've found. Unlike the other games it's as important to explore the mansion, and find the secret passages, as it is to question the suspects. The result is a playable indictment of murder, chock-full of exploration and movie moments when the killer strikes again.

**Publication of the Journal**

[illegible]

Pharmaceutical Research and Development



Murder 101 Miami is a three-part true-crime and graphic-adventure series based on a Dennis Wheatley murder mystery. In this digital version, you play Inspector Kermeking who's been brought in to investigate just another suspicious suicide. This time the victim is *Isabella Blaine* who, when alive, owned a company that controls half the soap market. *Carlton Rockhouse* owns the company that controls the other half of the market and it was his boss that *Blaine* was when he committed "suicide."

The game was written using an enhanced version of The Quill and I found it to be rather funny about the order in which you perform certain tasks. For example, Keating can't pick up his magnifying glass before he receives the memo about Blame.

The game consists of three parts that represent the three days of the investigation. They must be completed in order - you save the game position after each part so that you can load in the next.

## Mitglieder von einer Mitgliedsgruppe

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So Charles Fortmorth and his trusty manservant Regis are enjoying a trip down the Mississippi when they stumble across a body and a murder in session. With the blood still warm, our aristocratic sleuth sets out to search the cabin for clues and question the passengers about objects he has found, the victim, other characters, and themselves.

Through jessie's control our heroes explore the downtown and its cabins and question anybody they meet through jessie's means. From their testimony you can pick out crucial points for your notes. These notes form the foundation of your investigation and can be shown to other characters, such as the judge, to get their reactions and perhaps more clues.

Unfortunately, Sir Charles and his sidekick represent a stereotyped American view of the British and so the game is limited with 'I say, My Lord's' which can be irritating but if you manage to ignore them you'll enjoy the game.

# Making Music

*The Commodore 64's sound chip, SID, is among the best of its kind. Yet it's proverbially hard for the beginner to get to grips with. In the first installment of a new series*

*Peter Gerrard shows you how.*

**By Peter Gerrard**

**W**hether your Commodore 64 is new or old, you must all have read phrases like 'Your Commodore 64 computer is equipped with one of the most sophisticated electronic music synthesizers available on any computer'. You then look at a simple thing to produce just one note, and soon realise that sophistication is not equivalent to ease of use. A myriad of POKE instructions, no special BASIC keywords to make the task easier, and an awful lot of work required to make even the simplest of noises.

There are its bad points. But what of its good ones? What, probably, does the Commodore 64 give us for our money?

## The SID Chip

The quietly named SID (boringly standing for Sound Interface Device) is indeed a very powerful custom-built chip. Most other computers with sound capabilities have something like an AY Sound Generator built into them and this, although it itself useful, cannot hope to compete with the excellence of something that was designed for a specific computer. AY chips are mass produced, and can be used by many different machines, but SID is a one-off and was built just for the Commodore 64. If you see SID, till here!

## Voices

SID has the capability to control three separate musical 'voices'. That is, three distinct effects can be created and used to produce anything from a musical

concerto to discordant noise. One voice could be producing a sound rather like an accordion, another could be imitating a harp, while the third could be producing some kind of persuasive effect. However, SID is not without its faults in this respect, since we have to play all three of these voices at precisely the same volume. We can control that volume without reaching for the volume control of the television or monitor (since the Commodore 64 is one of those rare home computers that produces its noise through an external rather than an internal device, but that volume must be the same for all three voices. Other factors, as we shall be seeing, must also remain constant across the three voices.

## Envelopes

Envelopes, as well as being something that you can post a letter in, also find a very useful home in the world of music, and the world of computer music in particular. The type of sound produced by any of the Commodore 64's voices is determined to a large extent by the musical envelope being used to create that sound. It affects the voice quality, and can be independently altered for any of the three voices.

The four factors controlling a musical envelope are referred to as Attack, Decay, Sustain and Release, or ADSR. From now on, Attack tells us how long it takes a note to rise from zero volume to maximum volume. Decay refers to the length of time taken to fall from that peak volume to merely a half of that volume. Sustain then determines the length of time that the note is then played at half volume,

before Release tells us how long it takes the note to fall back into silence once more. ADSR collectively make up the envelope of a note, and as we've seen can be independently altered for any of the three voices.

## Waveforms

The waveform of a note is another factor in determining precisely what type of note is going to be played. On the Commodore 64 we have control over four distinct waveforms, and these are known as Triangle, Sawtooth, Pulse and White Noise. Typically, a triangular waveform can be used to produce a mellow sound, rather like a flute, while a sawtooth waveform, rich in harmonics, has a more ardent tone, like a trumpet perhaps. Pulse waveforms are possibly the most interesting, since they can be used to produce anything from a dull, hollow tone to an almost nasal whine.

Finally, white noise waveforms are precisely what they say they are, and are usually used to produce sound effects ranging from something as straightforward as a warbling on a shore, or a snake hissing at its prey, to something more complicated, like the percussion section of a rock group. The group 'Ylven Underground' were once described as playing music that sounded just like 'white noise'. How they would have liked the Commodore 64!

## Filters

Each of our three voices can have a totally different envelope, and can also be playing any one of the four

waveforms independently of the other voices. Similarly, each voice can either be filtered or not, but the effects of filtering are then the same for any voice that is being treated in this way. Filtering refers to the reduction of frequencies around a particular frequency, perhaps losing those above a certain level, or below a certain level, or perhaps passing those frequencies either within or outside of a band of frequencies. Four different types are available to us on the Commodore 64.

### Advanced Features

Two very advanced features are also available to us on the Commodore 64, and are not often encountered on relatively inexpensive home computers. The first of these is known as Ring Modulation, and despite its rather unusual title refers to nothing more complicated than modulating one voice with respect to another. In other words, if one voice were modulated with voice two, then anything that one voice would do would also be echoed, in some way, in the other voice. This is one of those things that is easier to demonstrate than it is to explain!

Synchronization is another step in the direction of a true synthesizer rather than an ordinary noise-making machine. As with ring modulation it is probably easier to grasp the concept by listening to something rather than reading about it, but basically it involves linking one voice with another so that, rather than modulating, or varying the frequency and volume of one voice with respect to another, we try and produce the same sound with two (or even three) voices. This one could produce a simple twelve bar riff with one voice and synchronize it with another voice, so that by merely altering one note in the second voice the twelve bar riff is instantly playing in a different key. We'll be taking a closer look at this sort of technique later.

### Conclusion

Well, the Commodore 64 is equipped with one of the most sophisticated electronic music synthesizers available on any computer. It's just one of the most complicated to use, that's all.

Throughout the rest of this supplement, however, we will be making life as useful as easier, and by traversing the gulf from a single note to a ten minute interrupt-driven

soundtrack, and (almost) a true synthesizer we should manage to cover just about everything that the Commodore 64 is capable of doing by way of producing music.

The key to all of this is, of course, the SID chip and its contents, so we'll now take a look at those.

### SID Chip and Contents

The SID Chip, as we have already seen, is a purpose-built one, designed specifically for the Commodore 64. As such it takes up a reasonable amount of memory within the 64 without affecting anything that might really be of concern to you, the programmer. Its code is quite happily resident in ROM, it takes up none of the available RAM space, and the spare 4K of RAM (from \$C000 to \$CFFF) is more than enough to cope with the more sophisticated sound effects that we will be coming to later.

However, as far as programming the chip goes we have a mere 28 bytes to play with. Of those, only 23 are of any real concern to us, since five of these are what is termed **Read-Only**, and cannot be altered by simple PEEKing and POKing. In fact, they cannot be altered at all, and although they are not without their uses for any of you who might happen to possess a potentiometer or an oscilloscope perhaps, we will ignore them for the rest of this supplement. As far as affecting 99% of all sound programs go, they are the Commodore 64's equivalent of certain England footballers: there to make up the numbers.

The other 25 bytes are, on the other hand, of great interest to us, and we will be dealing shortly with each of them in turn, since without a thorough knowledge of where they are and how they work we cannot begin to produce anything even vaguely useful. These 25 fall into the category of **Write-Only**, which means that we can alter them but not manage to see what is in the first place. This, as you might think, is something of a problem at times.

As the risk of offending readers who know all about selectively altering the contents of memory locations (since that is all we can do with these 25 bytes, or Control Registers) to give them their grander title, a few words of explanation.

### PEEKing and POKing

Everyone is familiar with statements like POKe \$1232 or PRINt PEER \$1232. That is, put the value 32 into memory location \$123, or print out the contents of memory location \$123 respectively. However, as far as the 25 control registers of SID are concerned, PRINt PEER (regrettably) produces nothing sensible. Try PRINt PEER \$4296, which is one of the registers in question, and see what happens. You will be told that register \$4296 contains a zero. So, alter it with POKe \$4296,23 and then try PEEKing it again. To all intents and purposes it still contains a zero, or a hint that is what the Commodore 64 wants you to think. It does, in reality, contain the value of 23, but we cannot find that out directly. Other methods there to be used, and by far the simplest of these is to keep track of a variable, if I say, so that we could POKe \$4296,11 and PRINt 11 so find out what is going on.

Unfortunately for us, some of these 25 control registers perform more than one task. Six of them do, in fact, and they are all of vital importance to us in our quest to produce something that would make Jean-Michel Jarre sit up and take notice, or Ron Hubbard for that matter. As far as those six registers are concerned then, a simple POKe command will not normally suffice. We must selectively alter the contents of a register, not just alter it willy-nilly. Consider the following example.

POKе \$4296,15

POKе \$4296,16

Although the value put into register \$4296 is different by just one in the two POKe statements, the effects that would be produced are vastly different, to say nothing of catastrophic under certain circumstances. What do we really mean, then, when we POKe \$4296,15?

The Commodore 64 is an 8-bit computer, which means that any byte, no matter how many bits it is, is 8-bits. Any one location, control register, will in what you will, consist of 8 bits. As you probably also know, the maximum value that can be POKed into any one location is 255, and think of a direct result of it being an 8 bit computer. 84 is short for Binary digit, and is the smallest value that the computer can understand. They (computers that is) work at their most efficient when everything is converted into binary digits. After all, a

computer is nothing but a collection of electronic circuits, and a circuit can be either on or off, nothing else, and so the binary system of counting is ideal for representing these two states. Binary uses only the numbers zero and one, so a zero would represent a circuit that was switched off, and a one, a circuit switched on. Since there are eight bits to the byte (and you, four bits really are referred to as a nybble), we can think of a byte as looking like this:

```
000 004 008 016 020 024 028 032
1 4 3 2 1 0
```

Since have eight bits (numbered from zero to seven) and each of those eight bits can be either on or off. The numbers above those bits refer to the value that each represents. Thus, if bit 7 were turned on and all the rest were turned off, then the byte would contain the value of 128. If bit 6 were turned on and the rest turned off, it would contain the value of 64, and so on. Now then, if bits 3, 2, 1 and 0 were turned on, and the rest turned off, what value would be in there?

Add up the numbers 008, 004, 002 and 001 and we arrive at 15, as in POKE 54296,15 given earlier. If bit 4 were turned on, and the rest turned off, the byte would contain the value of 16. Again, as in POKE 54296,16. Do you see what has happened? By POKEing with 16 instead of 15 we have turned on a bit that was previously turned off, and turned off four bits that was previously turned on. If this were a register with just one purpose it wouldn't make any difference, but 54296 happens to be one of those with a dual purpose in life, as we shall be seeing shortly.

## Turning On

Consequently it is important, when allowing this and other dual-purpose registers, to make sure that what was turned on remains turned on (if necessary), and what gets turned off is indeed what we want to turn off. This is achieved using the commands AND and OR, which, as you may know, work like this:

```
100000
100100
```

Adding these two numbers together produces the result 000100. In other words, wherever there is a 1 in the top row that corresponds with a 1 in the bottom row, we put down another 1.

Anything else results in a zero. Thus bits 7 and 6 remain turned on, the others are turned off.

On the other hand, ORing these two numbers together produces an entirely different result, namely 11001100. In this case, wherever there is a 1 in the top row OR a 1 in the bottom row we put down a one. So, in this instance, bits 7, 3, 2 and 1 remain turned on, and we also turn on bits 6 and 5 (this is beginning to sound a bit psychedelic). The rest remains off.

By selectively altering various bits of a byte, then, we can happily work with dual-purpose registers and alter only that which we want to alter. A trifle, but necessary, diversion, if we are to get the best out of the 25 available-to-alter control registers of the SID chip. And now, before we go any further, what do these registers do? The following chapter shows us that. This is to be our little from now on. We can do nothing but alter the contents of those 25 registers, and without knowing where they are in memory we're not going to get very far. Don't worry yet if some of the terms used don't make a lot of sense, all will be revealed in the long run.

## First Steps

As can be seen from the diagram of the SID Control Registers, there are an awful lot of memory locations to worry about in the world of sound. However, to make life easier for us in these early stages we are only going to bother with eight of those 25 registers, and these eight are made up of seven for voice on, and the overall volume control for all three voices.

In order to produce a single note, which is all we'll be bothering with here, there are a number of steps to take. First of all, it's always best to clear out any extraneous values that may be stored in any of the 25 registers, and this can be achieved by using a simple FOR ... NEXT loop, like this perhaps:

```
5 FOR I=0 TO 24:POKE 54271+I,0:
NEXT I
```

There, it is always wise to declare a variable equal to one base location, since remembering things like 'variable plus 1' is a lot easier than trying to recall all the different numbers like 54279. Usually I use the variable V, and so the second line of

our program would be something like

```
10 V=54271
```

Having done that, four simple steps are necessary in order to be able to produce a note. We'll now consider each of those steps in turn.

## Volume

If you look at the table of SID control registers, you'll see that the volume is governed by location V+24. It is also one of those registers that is altered more than one function in life, but for now we are concerned only with having the volume on. From the table, and our earlier discussion of bits within bytes, you will probably realize that the volume can range from zero through to 15, since the first four bits of the register are used to control the volume, and turning all four of those on gives us a value of (8+8+2+1), or 15.

A little bit of common sense seems to tell us that the maximum volume would relate to the maximum volume, and so if we alter location (V+24) by POKEing it with a 15, we will achieve that maximum volume. It helps if you've got the television set tuned properly and the volume turned on as well.

Consequently, the next line in our program would be something along the lines of:

```
15 POKE V+24,15
```

We must now turn our attention to the envelope, or ADSR shape, of the note that we're going to play.

## ADSR

Later on we'll be looking at this in much more detail, and with the aid of a program showing precisely how the different ADSR settings, or Envelope shapes, determine to a large extent the quality of the note being played.

For now, we will concern ourselves with two facts. The locations affecting ADSR for voice one are (V+5) and (V+6), and each of those locations is split into two halves, at register 4. The top half allows attack and sustain respectively, while the bottom half concerns itself with decay and release, in the order. So, when we alter the content of location (V+5) we are affecting both the attack and the decay rate. Marking back to our discussion of

## SID CONTROL REGISTERS

Base Location = 54272

Location Bit Diagram	Base	Function
54272 0 1 1 1 1 1 1 1	0	Low frequency value
54273 0 1 1 1 1 1 1 1	+8	High frequency value
54274 0 1 1 1 1 1 1 1	+2	Low pulse width
54275 0 1 1 1 1 1 1 1	+3	High pulse width
54276 0 1 1 1 0 2 2 0	+4	Wavelengths/Ring Mod/Synch
54277 2 2 2 2 1 1 1 1	+5	Attack/Decay
54278 2 2 2 2 1 1 1 1	+6	Sustain/Release
54279 0 1 1 1 1 1 1 1	+7	Low frequency value
54280 0 1 1 1 1 1 1 1	+8	High frequency value
54281 0 1 1 1 1 1 1 1	+9	Low pulse width
54282 0 1 1 1 1 1 1 1	+10	High pulse width
54283 0 1 1 1 0 2 2 0	+11	Wavelengths/Ring Mod/Synch
54284 2 2 2 2 1 1 1 1	+12	Attack/Decay
54285 2 2 2 2 1 1 1 1	+13	Sustain/Release
54286 0 1 1 1 1 1 1 1	+14	Low frequency value
54287 0 1 1 1 1 1 1 1	+15	High frequency value
54288 0 1 1 1 1 1 1 1	+16	Low pulse width
54289 0 1 1 1 1 1 1 1	+17	High pulse width
54290 0 1 1 1 0 2 2 0	+18	Wavelengths/Ring Mod/Synch
54291 2 2 2 2 1 1 1 1	+19	Attack/Decay
54292 2 2 2 2 1 1 1 1	+20	Sustain/Release
54293 0 0 0 0 0 1 1 1	+21	Low frequency
54294 0 1 1 1 1 1 1 1	+22	High frequency
54295 0 1 1 1 2 2 2 2	+23	Resonance/Filter
54296 0 2 2 2 1 1 1 1	+24	Filter type/Volume

'0' - bits we are not concerned with, or cannot use.

'1' - bits affected by first mentioned function.

'2' - bits affected by second mentioned function.

'3' - bits affected by third mentioned function.

Locations 54272-54278 affect voice one.

Locations 54279-54285 affect voice two.

Locations 54286-54292 affect voice three.

Locations 54293-54296 can affect all three voices.

bits and bytes again, we will see that four bits can give a value in the range 0 to 15, so it makes sense to think of both attack and decay as varying within that range.

However, how can we POKE two numbers with values between 0 and 15 into the same register? Well, think about it, and you'll see that the decay rate is indeed a value from 0 to 15 (it affects the lower four bits of the byte), while the attack rate is determined by the top four bits. Assuming then that we have an attack rate of somewhere between 0 and 15, then by multiplying that value by 16 we can arrive at the overall value to be stored in location (V+3). So, for an attack rate of 2 and a decay rate of 9, we would arrive at a final value of  $(2*16 + 9) = 41$ .

Since the same principle applies to sustain and release as well, with sustain being multiplied by 16 and release just having a straightforward value, the next line of our program (assuming a sustain value of 1 and a release value of 5) would look like this:

**20 POKE V+8,41:POKE V+2,1**

The third step is to consider the wavelength of the note that we're going to play.

### Wavelength

We have already seen that there are four different types of wavelength available to us on the Commodore 64: triangle, sawtooth, pulse and white

noise. From the table of control registers you'll see that the wavelength is governed by location (V+4), and that this is yet another of those eight-purpose registers. Ignore those bits that affect ring modulation and synchronization for now, and we arrive at the following mini-table of values:

Wavelength	Value
Triangle	17
Sawtooth	33
Pulse	65
Noise	129

That is, by putting a value of 17 into location (V+4) we would set the wavelength of voice one to be that of a triangle. Putting a value of 33 in it would turn that voice off, although into noise just as effectively. In a similar way, we would put a 33 into location (V+4) and get a sawtooth waveform, or put a 32 there and turn it off again. Noise is just that, noisy, and although you're welcome to experiment we'll stick to something a little bit more musical for now.

The Pulse waveform is the most interesting, and requires two more locations to be brought into play, namely (V+2) and (V+3). These determine the width of the pulse, that is, the length of time it takes between two successive peaks of the waveform itself. (V+2) is the low value of the pulse width, and (V+3) is the high value, or to put it another way, if we had a value of 4 in location (V+2) and 25 in location (V+3) then the overall pulse width would be  $(4*256 + 25)$ , or 1049. Multiply the high value by 256 and then add the low value. So if you can figure out why that should be so, remembering that only numbers between 0 and 255 can be stored in a single byte.

Experiment with pulse waveform by all means, altering the high and low values after you've set the waveform itself. For now we'll stick to a sawtooth waveform, and bearing in mind an important fact when producing music on the Commodore 64 (it is ALWAYS advisable to clear the waveform and then reset it before playing a note) we arrive at the next line in our program:

**25 POKE V+4,33:POKE V+3,15**

Finally, we need to play the note itself.



# Games Reviews

*If you've got a bit of spare cash then a game is as good a way as any to use it up. Here's a selection of some of the latest software on offer.*

## ENDURO RACER

**A**t the end of the Coin-op Conversions feature (Your Commodore July 87) I predicted that there were more conversions on their way. As if to prove my point Activision shows its version of the Sega coin-op bike racing game.

The object of the game isn't to win a race but to complete five stages within set time limits. If you don't beat the clock your game will end.



The first stage is a simple track that's flanked by trees to warn off anyone trying to cut corners. Bike-racing barriers are strung across the whole track and can be only jumped by a well-timed wheelie.

In the next stage giant boulders block your path, both on and off the track, and in stage three the track is surrounded by water so any mistake will end in a costly loss of time.

There are other bikes in the race but these seem to take no part in the game as you can happily ride through them without crashing or even slowing down.

Sadly this is another case where the C64 game is a direct copy of the original Spectrum game and wastes the C64's superior sound and graphics capabilities. A waste of a game that could have been a coin-op classic.

**T.H.**

**Title:** Enduro Racer. **Supplier:** Activision, 25 Paul Street, Hampstead, London N6P 2PN. **Tel:** 437 1161. **Machine:** C64. **Price:** £9.98. **Originality:** 3/10. **Playability:** 5/10. **Graphics:** 3/10. **Value:** 3/10.

## EAGLES



**T**he year is 2846 and the galactic three hundred year old war is now fought by genetically-created beings like you self. Now you are once again ordered to scramble into the sky in your Eagle aircraft to defend the planet against alien attack.

The screen is split into two Defender-style game screens in which you and your partner must blast away at the terminators, killer squads, nasty patrols, warbirds, bombers, tanks and fireballs that have invaded every zone. As your skill improves you'll be able to collect the enemy message drums that you must deliver to your underground base. Collect five of these and your ship will be equipped with a Devastator device which acts like a smart bomb destroying all aliens on the screen.

The second ship can either be controlled by a human or computer opponent, that you compete with to get the most kills to win the honour to lead the squadron. If you're playing against the computer or a head to head opponent you must dod to death to prove your superiority. This seems unlikely - it's a little pointless to have Eagles fighting each other when there are hordes of aliens to be destroyed.

A poor game that falls short of Huxson's usual

standard.

**T.H.**

**Title:** Eagles. **Supplier:** Hewson Consultants, 369 Alden Road, Epsom, Surrey, Middlesex, Surrey, Surrey, Surrey. **Tel:** 0233 817038. **Machine:** C64. **Price:** £9.95. **Originality:** 2/10. **Playability:** 3/10. **Graphics:** 3/10. **Value:** 3/10.

## I BALL

Where's that smoke coming from? Oh no, it's my power supply burning up. You see I loaded up I Ball about five hours ago and I can't stop playing it.

When I loaded I almost fainted - the speech is fantastic. A funny little voice says 'I Ball, I Ball'. This sounds wonderful. When you are killed the voice says 'Oh no!' and at the end of the game the voice says 'Game Over'. The music is also brilliant and very well thought out, which gives the game a very polished feel.

You control a renegade ball, on a mission to rescue his pals from the totally evil enemy ball. Your pals, laser ball, oddy ball, glow ball and so ball are all scattered across 16 different defence zones and one pal can be found at the end of every fourth screen.



Reaching them is no easy task; there are solid obstacles and electric barriers that will vibrate you on contact, together with the millions of nasties that inhabit the defence zones. If you shoot a lot of these a power disk will appear (think of Nintendo here) and when collected will give you extra weapons such as a Single Laser, which lets you fire sideways, a Turbo, which gives you extra speed, and a Buffet spray, which gives powerful fire support above and below you. Also available is the Molecular Bomb which nullifies all the electrical barriers (very useful). Another wicked weapon is the Rainbow Kipple Laser (sounds a bit like Salamander) which will blow the most confident Pod Person from Mars into a thousand blistering blisters.

Sound-wise this game is great, with good speech, good music and good spot effects. It is also strong on graphics with clear characters, no flicker, smooth scrolling and neat effects produced by the weapons.

I could go on for ages about the great gameplay, fantastic voice and sheer addictiveness of the game, but I won't.

Go and buy I Ball. If you don't you must be mad R.R.

#### Toolbox

**File:** I Ball. **Price:** £14.95. **New Oxford Street, London W1C 1LF.** **PS:** Tel: 076-4725. **Machine:** C64. **Value:** £1.99. **Originality:** 5/10. **Playability:** 5/10. **Graphics:** 5/10. **Value:** 10/10.

## CHAMPIONSHIP BASEBALL

Championship Baseball is a rework of Gamstar's previous attempt to capture the thrill of home runs, base hits and loaded bases and adds split-screen pitching as well as four divisions of opponents, and play-offs for the



championship playoffs.

Your first task as coach is to select your batting line-up to face the first match. Make sure you've got some stable players sitting on the bench in case your star batsman bolts out or your pitcher starts giving away home runs.

As the game begins the screen shows a sideways-on view of the ball park with flickers spread around the bases and the outfield. When a ball is about to be pitched half the field is covered by a 3D batsman's view of the pitcher as he winds up to deliver change-ups and fast balls. Once the ball is hit the screen reverts back to the whole fielding screen.

The month looks and plays like a patch stuck on to the original (poor) game. You're left wondering why the game wasn't totally rewritten to produce full 3D action. The night have come near to its claim to be the 'most realistic baseball simulation you can find'. I'm sticking to baseball.

T.H.

#### Toolbox

**File:** Championship Baseball. **Supplier:** Activision (Gamstar). **21 Pond Street, Monmouth, London NW9 2PW.** **Machine:** C64. **Price:** £9.99. **Telephone:** 011 3101. **Originality:** 3/10. **Playability:** 5/10. **Graphics:** 5/10. **Value:** 5/10.

## OINK!

Ever wondered how a magazine is put together? Well, here's your chance to see how the Editor and staff of Oink fill the pages with jokes, features and competitions.

The game comes up as Uncle Pigg, the Porky proprietor of Oink! and you must play three sub-games to win bonus panels that are used to fill the comic. You can compete the

sub-games as often as you like but after each game you're three hours closer to the deadline.

Game One is basically *Breakout* - your missile firing but must bounce Pete's Purple tank to destroy a series of brick walls while fighting off hordes of deadly aliens. In Game Two you steer Hubbardman through a series of zones in which you must fly over obstacles and under bridges while conserving power. Game Three stars Tom Thing as he charges around a complex in his Thagmobile, fights zombies and hula trappers while he attempts to collect (shoot) bonus points, extra lives, and a score which represents the magazine's growing circulation.

As the pages build up you'll be able to read the adventures of these heroes as well as check your horoscope, read jokes and enter competitions - but I doubt you'll have the time.

Across the far side of the galaxy, the deadly Moose-faced Warlocks of Throings are about to invade the peace-loving Fried-Egg People of Nostrina, but forget them as you'll be too busy playing this addictive game.

T.H.



#### Footnote

**Title:** *Gerns*. **Supplier:** CRL Group PLC, CRL House, 9 Kings Lane, Carpenter's Road, London E3 2JD. **Tel:** 011 2618. **Machine:** C64. **Price:** £8.99 (Cassette) £14.99 (Disk). **Originality:** 8/10. **Playability:** 8/10. **Graphics:** 8/10. **Value:** 9/10.

### GERRY THE GERM

I've heard of some duff titles but this takes blood. You play the part of a germ who has failed his stinkplasma exam and, filled with indignation, he sets out to claim the title of 'Virus Of The Year', so all he goes to infect a body with his disease. To start off with he has to deprive the lungs of air thus starving the brain, but while doing this he comes under attack from the red blood cells and white cells. So he then moves on to the kidneys. Here he must again dodge the white and red blood cells, and while he is doing all this he must collect four wacky kidney beans (wait for it!) so he can go to the loo.

Next it's onto the stomach where he must grab a bottle of acid and dissolve the aspirin which blocks the exit to the rectum. Junk food is another problem, you must stop this entering the stomach just by touching it, and when all that's

been done (phew!) it's on to the pancreas. This is a tricky little screen and a bit stupid too. You must infect the medical supplies by eating (i.e. headbutting) them - daft isn't it? Again there are blood cells to be avoided, plus a tickler inspector complete with steam-engine. If you go to the engine you can cause a fight between the engineer and the driver by throwing coal at the latter...er...er...just what planet does this so-called human come from?

And now the one you've all been waiting for The Heart. The idea here is to cause a heart attack by deflecting an arrow into the post-organ. To deflect the arrow just use the television (sic) but the arrow will kill you if you do not have the TV. With all this done you are now eligible for a 'ventricle diploma degree'.

Well, I must admit this game is different but that doesn't always make for brilliance does it? I find the plot is in bad taste and some of you may well agree. Gameplay is rather dull and slow and it can often get quite tedious. The music, supplied by Bob Hubbard, is brilliant, really jolly and bouncy. About seven tunes in one game can't be bad.

So should you go out and buy this game? On the grounds of cool music maybe, but the game leaves a lot to be desired. If you are bored and have two quid to spend it might prove entertaining - for a while.

K.R.



#### Footnote

**Title:** *Gerry the Gerns*. **Supplier:** Firebird, Wellington House, Upper St, Marston Lane, London WC1M 6EU. **Machine:** C64. **Price:** £1.99. **Originality:** 7/10. **Playability:** 3/10. **Graphics:** 4/10. **Value:** 8/10.

### MILK RACE

Put on your shorts, fill your water bottle (sorry, milk bottle) and jump on your 1-gear moped, yes it's here - Manchester's Milk Race. Was it worth the wait?

Well I'm saying nothing yet. The idea is simple - just race through all the major cities of England - sounds simple doesn't it? As just one of the 84 Competitors in this year's Milk Race you'll need to summon up all your energy and stamina to maintain 1st position over all 12 stages of the race which you must do in order to win.

The game starts up with the title screen of a man pedaling

his bike up a hill accompanied by a soundtrack which also plays through the game. With a tap on the joystick button you are then presented with a map of England showing the route marked out and numbered. Tap the joystick again and a menu is thrown up on the screen which will let you choose a joystick in port two, redefine the keyboard or choose preset keys.

When this has been selected, it's onto the game, you start off in first gear and can change, if you wish up to 15th gear, depending on road conditions. The road is shown on a little graphic icon in the corner of the screen which rises and falls - when on level ground it falls straight. I thought this a good touch.



The game, however, can be quite frustrating - you will probably find yourself screaming at your computer as you are killed off without any warning by a hit-and-run car driver. This causes a time penalty which could result in the game ending, but practice makes perfect.

I quite enjoyed this game, the graphics are good, the sound is good and there are some very nice touches. For example when you ride past a spectator he will turn his head as you pass him - this gives a good feel and adds to the atmosphere.

For only £1.99 who can mean (Mary Whitehouse?) Go and get it before the shops sell out, quick. **K.R.**

#### Touchline

**Title:** *RAN Race*. **Supplier:** Mastertronic, 8-10 Finsl Street, London EC2A 4JW. **Tel:** 01-777 6890. **Machine:** C64. **Originality:** 2/10. **Playability:** 2/10. **Graphics:** 5/10. **Value:** 10/10.

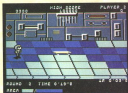
## METROCROSS

**I** was horrified when I saw the adverts which came out for U.S. Gold's Metrocross. Why is it that I hear you shout?

Well remember Breakthru and Legend of Kage - yes, these are just a few of the dreadful games to come from this company. It seems that nearly every time they release a licensed game (film or arcade) they always make a pig's ear of it.

So you're sitting there now thinking I'm going to tell you what a load of old rubbish Metrocross is! Well you're wrong.

I love it, it's really addictive and fun to play. Although there is no story line to speak of as it's such a simple game, this is more than likely what makes it so playable. *Anyone* could play - even our editor (careful, sorry - Ed).



You are a little man competing in a fantastic race inside an extensive complex. There are also various traps including water holes which if fallen into, will lose you time as you struggle to get out. Then there's the Electro Maze which sends you flying as you receive an electric shock. Again these will mean you causing loss of time. Next come the Hurdles which must be avoided or jumped, otherwise you'll end up on the floor losing more time. Green Maze slows you down to a quarter of your normal speed, and other carries include cold cars (no doubt a sneaky bit of advertising) and rats which cling onto you and must be shaken off as they will slow you down.

On the helpful side there are quite a lot of things such as Springboards which will bounce you a short distance a twice your normal speed. Green Cars speed you along no matter where you are on the screen, but these only last for a short time. Blue Cars can also be found lying around - if you jump on these the clock stops for two seconds (gasp).

When you register all the traps and make it to the final line you stop and take a rest. This is quite good as your legs put in hands on its knees and puffs and blows (just like the arcade). Then it's on to the next round - there are 10 in all. I am very impressed with this excellent conversion. It plays well, the graphics are faithful, if a bit blocky, and the music is almost exact, I'm hooked, so what are you waiting for? Go and buy it now. **K.R.**

#### Touchline

**Title:** *Metrocross*. **Suppliers:** U.S. Gold, Unit 2/3 Holford Way, Holford, Nottingham BN 74E. **Tel:** 079-354 2300. **Machine:** C64. **Price:** £9.99. **Originality:** 1/10. **Playability:** 9/10. **Graphics:** 2/10. **Value:** 5/10.

## FIRETRACK

**W**hy is it that most shoot-em-ups are set in the 12th century? Who cares - it's bad enough reviewing a game that is total rubbish and just another rumble of an old game that was crap in the first place, without having to puzzle out

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these things. Firtrack is a swirling shoot-everything-but-runaway type of game. It contains four different worlds: Baseworld, Dustworld, Iceworld and Meltworld. The individual worlds are known to most people as the Firtracks and they're well known because of the pirates that inhabit them.

At first you think it's another routine mission to wipe out the pirates and their bases, then mission control informs you that somewhere in the Firtracks is a powerful source of energy known as the White Light. The light must be found for if it falls into the hands of the pirates it could mean total destruction of the surrounding planets! So you strap up your best drop of Rony-Lux and jump into your Hachfighter which speeds you off to save The Universe.



OK, first let's get the means out of the way. A really annoying 'feature' in this game is the built-in auto-lose. Yes, it loses by itself, although it doesn't destroy the gameplay too much. Right - that's my means out of the way, onto the graphics. They are nice, colourful and detailed, and the alien are well animated.

The different worlds are nice and big with a fair bit of variety thrown in for good measure. The end result is a playable and interesting game that doesn't leave a sour taste in the mouth. I think I might as well recommend this. CAG? Well done, Electric Dreams - keep it up! R.R.

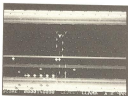
#### Touchline

**Title:** Firtrack. **Suppliers:** Electric Dreams Terminal House, Fremont Towers, Southampton, Hampshire SO9 1PE. Tel: 0703 226644. **Machine:** C64. **Price:** £8.99. **Originality:** 8/10. **Playability:** 8/10. **Graphics:** 7/10. **Value:** 8/10.

#### VOYEUR

It's been quite a while since Jeff Minter released a game, his last being Iridis Alpha. This was pretty good and contained his usual mind-blowing colours and totally weird game play.

Well, now Jeff's gone freelance and has written another psychedelic game, this one being a solid firsty shoot-em-up. The blurb on the inlay card is very interesting but when you actually play the game it doesn't seem to tie in.



Years and years ago, back in the 22nd century, there was a famous conflict known to the people of Earth as the Devil Wars. Hundredths of alien attacked the Earth's power supply grids suspended in space, but they were so much for us and promptly fled. Then one day (about 100 years later), a great telescope is used to monitor the planet, and a great movement of droids is registered. The aliens are planning to take Earth. Of course this can't be allowed, so you are zoned off to the nearest spaceship and told to intercept every alien that flies. Some things are more easily said than done.

Your ship consists of one main ship with another three that follow your movements and fire when you do. The graphics are a bit dated and are made from character blocks, so you can imagine how small they are. Nevertheless this game has an addictive pull so it, though it doesn't last too long. It's easy to play and you can select the level you wish to start on. Another unusual feature is the way the ship changes formation as you go through the levels and the screen wrap around (upside-down etc).

This isn't to say, but if you are an out-and-out shoot-em-up freak you might enjoy it, and it's only three quid. R.R.

#### Touchline

**Title:** Voyeur. **Suppliers:** Microscopic, 8-18 Paul Street, London. Tel: 01-277 6585. **Machine:** C64. **Price:** £2.99. **Originality:** 5/10. **Playability:** 8/10. **Graphics:** 4/10. **Value:** 5/10.

#### WIZARD

Well, Devil has come up with this game. I have to say this makes a change. Wizard is quite weird. Don't get me wrong, I am not saying it's rubbish - I'd be lying. You play the part of the wizard who lives on a colourful planet somewhere in space. So there he is minding his own business and admiring the nice landscape, when someone steals his colour!

Yes, the entire planet is now monochrome (yuck) so being a proud wizard he creates a novel form of transport with powerful offensive weapons, but these need to be bought with credits (I know it, Nemexis again).

Your Wizard, as the vehicle is known, becomes like a

normal ball. This makes it quite hard to control. Get a credit and you will be given three. Another credit gives you anti-gravity - this makes things much better as the ball will now only respond to the joystick instead of bouncing all over the place.

Weapons can now be activated and a Cat called up. The Cat is a small ball which has one fire, known as a Catella (mouse). You can also select weapons for your Cat such as multiple firing and a laser. If you want to be real greedy you can hog them for the Winball. Other weapons include a power beam which will fire above and below your ball.

Next comes the Cat which is a bargain at three credits, then there's the laser, a steal at only four, then the wicked Multi-fire. This awesome gadget will reduce any alien to a smouldering ash pit, now the huggs, yes, The Smart Bomb. This will wipe out any greedy alien with ease, just wiggle the joystick (hats how you select all gadgets) and — POW! — all the enemies are vapourised. A bit pricey at a modest 7 credits is the ultimate in Michael technology, The Shield. This little baby will keep you and your Cat safe and sound — you can charge about without a worry as aliens burst on impact with you. Sadly, it doesn't last long.

When you're happy with your weapons you can start collecting the colours — to do this you will need a Cat. The colours look like little balls but when shot they release a drop of pigment which must be caught by the Cat before it hits the ground.



At the bottom of the screen are cashdrops. These tell you how much colour you have — each drop of colour is added in. When these are full you are wiped off to the bonus stage. Here you can knock your score up easily and if you manage to last long enough you get the chance to get an extra Winball!

This game is brilliant. Stunning graphics, unbelievable music, compulsive gameplay and excellent presentation. Winball is sure to reach number one, no more.

Well done Sensible Software and right on, Ozma, for finding some talented programmers. Please keep it up.

Well don't just sit there reading. Sprint off and buy Winball. K.B.

#### Twoflower

**Title:** Winball. **Supplier:** Ozma, 4 Central Street, Manchester M2 2NS. **Tel:** (061) 832 9633. **Price:** £8.95 (Cover) £12.95 (Disk). **Originality:** 8/10 **Graphics:** 10/10. **Playability:** 10/10. **Value:** 10/10.

#### MAX TORQUE

**N**o, the title doesn't refer to Max Headroom's younger brother, but rather to a motorbike simulation from Bubble Box.



There is the usual course, divided into sections, each of which must be completed within a time limit if you are to progress onto the next stage. One interesting touch, as the authors try to bring a touch of originality to a well-worn subject, is that you can choose to control one of seven different riders. Each of these has his own particular skills and weaknesses as does the bike that they ride. In practice though, I failed to notice much of a difference between them but this could say more about the way that I drove rather than anything else.

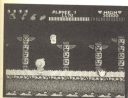
Controlling the bike is straightforward. Left, right, accelerate and brake with a choice of two gears plus a turbo boost. Your rear lights indicate whether you are braking or accelerating if you can't remember which way you are pushing the joystick. The graphics are large and clear and the game generally handles very well. Enjoyable if you don't already own a motorbike game but not offering anything special if you do. G.R.H.

#### Twoflower

**Title:** Max Torque. **Machine:** C64. **Supplier:** Bubble Box Software, 87 High Street, Tonbridge, Kent, TN11 1DE. **Price:** £8.95 (Cover) £12.95 (Disk). **Originality:** 5/10. **Graphics:** 5/10. **Playability:** 5/10. **Value:** 5/10.

#### WONDERBOY

**O**h no, not another arcade conversion, this must be about the 32 in this week. Those of you who have not been to the arcade will not have seen the brilliant game Wonderboy. The game plot tells of a youth and his girlfriend. One day whilst out walking in their wooded land an evil King called well, King kidnaps the girl and runs off with her.



So our brave little hero sets off to rescue her and defeat the evil King. This is not an easy task as you may guess. Wonderboy consists of 7 lands, each land divided into 4 sections and each of these four sections consist of another 4 areas (think about it) so our hero has a long way to go before he can finally confront King.

You start off in the jungle, with snakes, rolling boulders, snakes, weaps and snails (yuck!) all trying to kill you, then its on to the desert, where killer frogs (yuck!) and falling platforms must be negotiated. Backgrounds come in abundance, and very nice they are too.

Scattered around the playing area are various weapons concealed in eggs (eggs?) which have to be broken to find out what is inside. The first egg that you encounter contains a hammer which will give the nasties a good thumping and send them flying. There are also skateboards to be had, but these are sometimes a hindrance as you can not stop dead when riding them.

As you progress through the game, fruit appears regularly and can be picked for bonus points, and if you happen to come across a mushroom this will change all the fruit to junk food (yum!) and give you more time (vitality) on the clock.

I enjoyed playing Wonderboy, and I'm still playing it. So take my advice and buy it. You won't regret it acquiring this excellent arcade conversion.

Three cheers for Activision.

K.B.

#### Wonderboy

Name: Wonderboy. Supplier: Activision, 33 Pound Street, Hampstead, London, NW3 2PS. Tel: 01-431 1303.

Machine: C64. Price: £9.99 (Cassette). Originality: 3/10.

Playability: 8/10. Graphics: 8/10. Value: 8/10.

#### SPELLSEER

**S**pellseer is a 3-D maze game with a fantasy setting. The only storyline you are given to guide you is that you must seek out and destroy the evil sorcerer Azhara.

As you wander round the maze, you will find certain objects. Some of these will be found in empty rooms while others will be guarded by one of an assortment of monsters — goblins, witches, vampires and the like. Your only means of defence against these nasties is to cast a spell. Initially, you

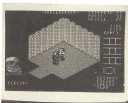
can only use a 'blast' spell. More potent magics have to be found.

As well as monsters, there are locked and invisible doors, floor different types of wall — both harmful and beneficial, teleporters and various. Controlling your character is a simple turn left, turn right and straight on for moment with two-function keys being used to scroll through the list of available commands.

The first problem with this game is one of working out just where you are. This is because the game decides to drain everything as your character sees it, rather than how you see it sitting in front of the screen. The results of this are most confusing and just about render the game unplayable — unless you happen to be the sort of person who enjoys maze-mapping and can easily cope with minor images of rooms. Then there is the fact that nothing seems to happen. You can wander round for long periods of time without meeting anyone or anything. And when you do, the chances are that they will not have anything that you need.

All in all, a very tedious game, let alone by several standards of gameplay. Give it a miss.

G.R.H.



#### Spellseer

Title: Spellseer. Machine: C64. Supplier: Empire. Price: £2.99. Originality: 4/10. Graphics: 4/10. Gameplay: 2/10. Value: 2/10.

#### ZOLIX

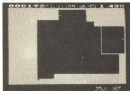
**O**ccasionally, a game comes along that it wads a simple idea but is also so infamously addictive that you curse yourself for not having thought of it first. Such a game is Zolix.

Derived from the 'Painter' type games popular a few years ago, the object of Zolix is to shade in three quarters of the screen. No more, no less.

You control a cursor which starts off on the edge of the screen. As you move it into the playing area, so it leaves a trail behind it. If you can connect your cursor to safe territory — either the edge of the screen or a previously

correctly typed black, then the area that you have just defined is filled in.

Naturally, it isn't quite that easy. Small dots move round the screen and background areas and if one of these touches your trail, a life is lost. Likewise if you go back on your own trail. If you trap one of the dots in an area, there is an impulse. The dot remains trapped but you don't fill in the area either. As you progress through the levels, so the number of dots increases. To help you out of a potential pickle, you can reverse the direction of the dots but only once on the first level, twice on the second level etc.



Graphically, the game is dreadful — the colour of the shading doesn't even change when you progress onto the next level. This just goes to show that great graphics aren't the be all and end all of a good game.

For only £1.98, Zolyx will appeal to any strategy fans who will, like me, spend hours working out whether it is better to go for a few large areas or lots of little ones. G.R.

#### Timeline

*Title:* Zolyx. *Machine:* C64. *Supplier:* Fiveted Silver, Wellington House, Upper St. Martin's Lane, London WC2N 8AN. *Tel:* 01-479 6715. *Originality:* 4/10. *Graphics:* 2/10. *Playability:* 8/10. *Value:* 8/10.

## BARBARIAN

**A**nd so it came to pass that the evil sorcerer Drax proclaimed that he would wreck havoc and doom on the Jewelled City unless the lovely girl I girl... oops! I mean, the beautiful Princess Maria, was delivered to him.

So the helpless people of the Jewelled City gave in and delivered the princess to him, but being quite a nice guy he said 'I will deliver her back to you on one condition. That is that you can defeat all of my demons'.

Many warriors tried to kill the demons but failed, then from far over the hills came a male model holding a sword. Sorry, a Barbarian holding a huge broadsword. He was the only hope.

You play the part of the Barbarian trying to defeat the

evil demons and win back the Princess.

As you might guess, this is a sword combat game. There's a list of moves and blocks available to the player. A few of the moves include The Web of Death, head bunting, kicks to the groin, lolllllllllll, leg chops and the lethal neck chop, which will slice off your opponent's head with a sort-of-chopping-somethin'-s-head-off sound (really gruesome). The blood spurts out as the body slumps to the ground with a thud and is dropped off by a giggling goblin.

There are two versions of Barbarian. Side one contains a two player I'm-gonna-kill-you practice game, the other contains the real thing in which you do battle with Drax's demons in order to save the princess from a fate worse than death (Duffel).

I enjoyed Barbarian very much, especially the blood and bring heads bit, and I'm sure that you kids will love it, in fact I'm positive. The two-player game is the best part of the package as you can try to beat your Aunt Hilda — until she gives you a deadly neck chop.

All good dirty fun, with good graphics, music and sound effects, and very good gameplay. Stop hitting your gran with that plastic sword and get this game NOW! **K.R.**

#### Timeline

*Title:* Barbarian. *Price:* £6.99 (Cassette) £12.99 (Cassette). *Supplier:* Pelican Software, 271 Portsmouth Road, London SW. *Tel:* 01-878 0750. *Originality:* 6/10. *Graphics:* 8/10. *Playability:* 7/10. *Value:* 6/10.

## MAG MAX

**A**fter nearly a year of waiting, Imaginer have finally released Mag Max, and it looks like it was knocked up in a week. This is not the first time Imaginer have cooked up an arcade conversion, and taken a year to do it (remember M&A?).

Why, oh why, do they insist on doing arcade conversions that they can't handle? This game is dreadful and into the lab arcade version.

You play the part of a robot, well a bit of one as you are not fully built yet, so you have to find parts of your body which will give you extra firepower.

You trundle across a drab-looking planet surface shooting at ground bases. This bit makes me laugh, as there are huge galore. For instance sometimes the bases can't be shot — your bullets go straight through them but they still die at you — and don't be surprised if you find yourself dying for no reason as this happens a lot.

The object of the game is to destroy a huge dragon that waits at the end of each level, which I managed with ease after a few attempts. The graphics are not so bad, but the glitches did annoy me a lot. Imagine there is no music but the one score sound is great.

This is a bit of mixed bag, I'm afraid. It does have good points but these have little addictive pull. Personally I wasn't impressed, but my brother loved it. **K.R.**

#### Timeline

*Name:* Mag Max. *Price:* £9.98. *Machine:* C64. *Supplier:* Imaginer, 8 Cornhill Street, Manchester M2 5NS. *Tel:* 061-432 0616. *Originality:* 5/10. *Graphics:* 4/10. *Playability:* 6/10. *Value:* 5/10.



# Universal Number Base Tutor

*Many people feel rather daunted when necessity forces  
them to start thinking in a number base other than 10.  
Help is at hand with our base tutor program.*

*By Michael Biddell*

## Program Breakdown

Line	Description
0	: Set border and paper colours.
2	: Dimension arrays for number conversion and answers to questions in quiz.
7	: Print menu.
8-180	: Convert decimal number to any base up to 16 by repeated division by the chosen base. Lines 88 to 131 are also configured as a subroutine used by other parts of the program.
1000-1100	: Convert any base to decimal. Lines 1070 to 1122 are configured as a subroutine.
1000-1090	: These lines ask 10 questions on number base conversions. You are required to convert five numbers from any base into base 10 and five numbers from base 10 into a specified base.
5000-5090	: Print the Menu and get human response.
6000-6070	: Subroutine to check for illegal alphabetical entry in decimal input.
7000-7070	: Print congratulations for perfect score.
7000-7090	: Graphic illustration of number base conversion. Base 10 to any base.
8000-8340	: Convert any base to any base, using base 10 as the common currency. This calls the subroutines at lines 88 to 131 and 1070 to 1122 previously mentioned.
8500-8540	: Subroutine to check for keyboard entry error.
9000-9027	: Routine to check for validity of a number in a particular base.
9900-9900	: Calculated "Goodbye" for Quiz.
9950-9970	: Allow only lower case entries from keyboard.
10000-10000	: Print random paper and border.
12000-12000	: Print random int.
60010-60070	: Emulate "print at".
60070-60150	: Emulate "int".
60050	: Emulate "int".
60150-60200	: Emulate "border".
60200-60300	: Emulate "paper".
60300-60470	: Emulate "loop".
60470-60500	: Emulate "pause".



The number systems used by most humans is in base 10, purely because we're gifted with 10 fingers as our rudimentary intelligence latched on to this fact when we first started to count.

Computers, however, have no fingers and communicate using different number methods and this is where many people get confused, because converting from one base to another can seem rather complicated at first.

This is where our Universal Number Base Tutor can come to your aid. It is an educational program which will show you the best methods of converting from one base to another (up to hexadecimal) as well as providing practice and a quiz for you to test yourself.

## Aims

This educational program was designed with the following objectives:

1. Convert decimal (denary) to any base.
2. Convert any base to denary.
3. Convert any base to any base (up to 16).
4. Demonstrate clearly how number base conversion is carried out.
5. Test understanding.

All these objectives have been achieved in the program.

With the increasing need to understand number bases fully under the modern maths approach, the program may well find application in schools as well as the home.

It is written in pure Microsoft Basic, on a modular basis and should therefore be easy to understand.

Number Base Tutor was originally written for the Spectrum and many Commodore users will see in it a neat and simple way of converting Spectrum listings for use on the C64.

## Program Structure

The use of 'ink', 'paper', 'print at' and 'tabler' subroutines etc. has produced a very legible Commodore listing, the lines many special Commodore control characters, it is therefore especially easy to type in. These subroutines can be used in students own programs to produce many colourful moving graphic effects.

### PROGRAM: NUMBER BASE

```

F3 1 GOTO 10000:GOTO 10000:FOR J=0:50
   2   20000:PRINT:GOTO 10000
F5 2 GOTO 10000:GOTO 10000:GOTO 10000
   3   30000:PRINT:GOTO 10000:GOTO 10000
   4   40000:PRINT:GOTO 10000:GOTO 10000
   5   50000:PRINT:GOTO 10000:GOTO 10000
   6   60000:PRINT:GOTO 10000:GOTO 10000
   7   70000:PRINT:GOTO 10000:GOTO 10000
   8   80000:PRINT:GOTO 10000:GOTO 10000
   9   90000:PRINT:GOTO 10000:GOTO 10000
  10  10000:PRINT:GOTO 10000:GOTO 10000
  11  11000:PRINT:GOTO 10000:GOTO 10000
  12  12000:PRINT:GOTO 10000:GOTO 10000
  13  13000:PRINT:GOTO 10000:GOTO 10000
  14  14000:PRINT:GOTO 10000:GOTO 10000
  15  15000:PRINT:GOTO 10000:GOTO 10000
  16  16000:PRINT:GOTO 10000:GOTO 10000
  17  17000:PRINT:GOTO 10000:GOTO 10000
  18  18000:PRINT:GOTO 10000:GOTO 10000
  19  19000:PRINT:GOTO 10000:GOTO 10000
  20  20000:PRINT:GOTO 10000:GOTO 10000
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  40  40000:PRINT:GOTO 10000:GOTO 10000
  41  41000:PRINT:GOTO 10000:GOTO 10000
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  96  96000:PRINT:GOTO 10000:GOTO 10000
  97  97000:PRINT:GOTO 10000:GOTO 10000
  98  98000:PRINT:GOTO 10000:GOTO 10000
  99  99000:PRINT:GOTO 10000:GOTO 10000
  100 10000:PRINT:GOTO 10000:GOTO 10000
  
```





```

03 THEN Y=13.5-0.15X-0.5,SCALING=0.1
04 PRINT#2:PRINT:GOTO 10
05 THEN Y=13.5-0.15X-0.5,SCALING=0.1
06 PRINT#2:PRINT
07 THEN Y=13.5-0.15X-0.5,SCALING=0.1
08 PRINT#2:PRINT:NUMBER IN
    THIS ROW
09 THEN INPUT CH:GOTO 0800
10 THEN OPEN#2:CLOSE#2
11 THEN IF LEN(CH)=0 THEN GOTO
    0800
12 THEN A=LEN(CH):MID$(CH,1,A)
13 THEN GOTO 0800
14 THEN GOTO 0800
15 THEN GOTO 0800
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99 THEN GOTO 0800

```

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# C16 Sprite

*Does your C16 lack a little something? Then add sprites with this useful utility.*

*By Frank Bingley*

When I first acquired a Commodore 16, I was impressed by the improvements made to Commodore basic. But it wasn't too long before I learned an old trick that Commodore had forgot one important feature which 64 owner's had come to take for granted. It didn't support sprites!

For most serious applications and general computer use, the computer performed quite adequately. It was only when I came to games programming that this missing feature became something of a problem. The only way possible to move object blocks of any size around the screen was to incorporate the necessary characters into a string, along with complicated control characters. These strings were then gobbled around using the handy CHAR command. This worked reasonably well, but suffered from screen scrolling problems and wiped out any other characters that got in the way!

These problems prompted me to write a machine code routine which would, to some extent, mimic the sprite facility on the 64. C16-SPRITE is an interrupt-driven routine with which it is possible to display a six character sprite anywhere on the screen. Certain points will instantly move the sprite around whilst others control which sprite data block is displayed as well as sprite to background priority. Other features are collision detection and selective priority (not found on the 64).

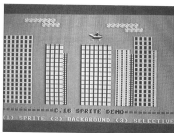
Along with notes on how to use this utility, I've included a short basic program which demonstrates how easy the system is. Equally good results

can be obtained by using this routine as part of a basic or machine code program. To effectively use C16-SPRITE, it will be necessary to know briefly how the routine works. A block of six characters (3 wide by 2 deep) will be displayed on the screen. Their position will be determined by two addresses which hold their X and Y co-ordinates. The actual characters (and colours) displayed will be held in a sprite block buffer, just above the

utility. Another address will hold the sprite block number. The sprite will be displayed either behind or in front of any other characters on the screen according to the contents of two other addresses. The system automatically remembers what characters and colours lie beneath the sprite, and replaces them when the sprite is moved or turned off.

Table 1 shows which addresses do what.

HEX	DEC	DESCRIPTION
\$1E04	15840	X Position
\$1E05	15841	Y Position
\$1E0D	15861	Sprite to background priority
\$1E0E	15862	Priority and character
\$1E0F	15863	Collision detection
\$1E12	15866	Sprite block pointer
\$2C60-\$3EE9	15360-16365	C16-SPRITE utility resides here
\$1F00-\$1FFF	16128-16383	Sprite data buffer
\$YS DEC ("1E07")		Turn on sprite
\$YS DEC ("1E17")		Turn off sprite



## Typing in C16 Sprites

Type in listing 1 as it appears and save to tape or disk after correcting any errors. Now run the program. Next, with the data in place, enter the monitor and save a hard-load version by typing:

```
S>C16.SPRITE:08,1C00,0009
```

Sometimes to use 00 instead of 00 00 using tape.

## How To Use C16 Sprite

Let's test the system. First protect the utility from being overwritten by Basic. To do this type:

```
POKE 5247:POKE 5647,C16
```

Now load 'C16 SPRITE' by entering monitor and typing:

```
L>C16.SPRITE:08
```

Type users will need to position the tape at the beginning of the utility before this command.

Next, we need to form a sprite. Either the standard character set or user-defined graphics may be used, but for this exercise let's keep it simple! Our test sprite will be a red inverse block.

At this point, I will explain how the sprite data is stored in the buffer. The buffer is divided into 24 blocks, each containing 12 bytes. The first 6 bytes of each block are for character data, leaving the other 6 for character colour. So, to fill the first block with inverse spaces, type:

```
FOR A=0TO255:POKE 06128+A,180:
```

## NEXTA

06128 is the first address for the first block, whilst 180 is the screen code for a reverse space. Now we need to add the colour. To do this, type:

```
FOR A=0TO5:POKE 06134+A,82:
```

## NEXTA

This will colour all of the reverse spaces a medium red. Having placed the sprite data into position, it will be necessary to let the system know where it is. So, to set the sprite pointer to point to our sprite, type:

```
POKE 15965,0
```

Finally, before we turn on the sprite, choose a position for it. For the X position, choose any value between 0 and 31. The Y position can be any value between 0 and 23. Addresses 15948 and 15949 are for the X and Y positions respectively, so choose values for X and Y and type:

```
POKE 15948,X:POKE 15949,Y
```

Now for the moment of truth! Clear the screen and turn on the sprite. Type:

```
SYS 1807375
```

If the above procedure has been followed correctly, then a red block will be displayed on the screen at your chosen position. If not, then turn off the sprite (SYS 1807375) and try again. Please note that the system will not respond to position values outside minimum and maximum parameters.

Don't be afraid to experiment a little more with our sprite. Try altering

some of the addresses in the above chart to alter sprite positions and colours or characters. Remember that C16 SPRITE is interrupt driven, so that it will not be necessary to keep turning on the sprite, just after the appropriate address for instant results. Also remember to turn off the system when not required (SYS 1807375), or strange things may start to happen!

If you wish to change sprite to background priority, then a 0 in address 15981 will cause the sprite to be in front of any characters on the screen. A 255 in this address will change it to be behind. It is possible to make the sprite lie in front of some characters and behind others. This can be very useful, and useful to good effect. Here is an example of how to use this facility:

```
POKE 15982,0:POKE 15981,1
```

Now, any characters whose screen code is within the range 1 to 255 (i.e. alpha characters), will now always appear in front of the sprite. Any others will be behind. Two rules apply here: all characters with screen codes within selected parameters will be foregrounded, and 127 is the maximum amount of foregrounded characters.

Another handy feature of this utility is collision detection. As long as our sprite rests in a clear part of the screen, address 15983 will contain a zero. If, when the sprite is moved, it happens to be in front of, or behind a character, then address 15983 will contain a 1. This makes collision detection a piece of cake!

## Limitations

Using C16 SPRITE will not cause the screen to scroll, but your program may. If this happens then the sprite characters will also scroll. This is, unfortunately, a limitation of the system. Another is that the system updates the sprite only if any changes in the control addresses are detected; this is to avoid flickering. However, flickering may occur if, during animation techniques, the sprite pointer is changed rapidly when the sprite is near the bottom of the screen.

## The Demonstration Program

Program 2 is the demonstration program which shows C16 SPRITE in action. Guide the helicopter through the skyscrapers by the following keys: F, Move left;





Year	Days	Hours	Minutes	Seconds	Milliseconds	Microseconds	Nanoseconds
2000	01	01	01	01	01	01	01
2001	01	01	01	01	01	01	01
2002	01	01	01	01	01	01	01
2003	01	01	01	01	01	01	01
2004	01	01	01	01	01	01	01
2005	01	01	01	01	01	01	01
2006	01	01	01	01	01	01	01
2007	01	01	01	01	01	01	01
2008	01	01	01	01	01	01	01
2009	01	01	01	01	01	01	01
2010	01	01	01	01	01	01	01
2011	01	01	01	01	01	01	01
2012	01	01	01	01	01	01	01
2013	01	01	01	01	01	01	01
2014	01	01	01	01	01	01	01
2015	01	01	01	01	01	01	01
2016	01	01	01	01	01	01	01
2017	01	01	01	01	01	01	01
2018	01	01	01	01	01	01	01
2019	01	01	01	01	01	01	01
2020	01	01	01	01	01	01	01
2021	01	01	01	01	01	01	01
2022	01	01	01	01	01	01	01
2023	01	01	01	01	01	01	01
2024	01	01	01	01	01	01	01
2025	01	01	01	01	01	01	01
2026	01	01	01	01	01	01	01
2027	01	01	01	01	01	01	01
2028	01	01	01	01	01	01	01
2029	01	01	01	01	01	01	01
2030	01	01	01	01	01	01	01
2031	01	01	01	01	01	01	01
2032	01	01	01	01	01	01	01
2033	01	01	01	01	01	01	01
2034	01	01	01	01	01	01	01
2035	01	01	01	01	01	01	01
2036	01	01	01	01	01	01	01
2037	01	01	01	01	01	01	01
2038	01	01	01	01	01	01	01
2039	01	01	01	01	01	01	01
2040	01	01	01	01	01	01	01
2041	01	01	01	01	01	01	01
2042	01	01	01	01	01	01	01
2043	01	01	01	01	01	01	01
2044	01	01	01	01	01	01	01
2045	01	01	01	01	01	01	01
2046	01	01	01	01	01	01	01
2047	01	01	01	01	01	01	01
2048	01	01	01	01	01	01	01
2049	01	01	01	01	01	01	01
2050	01	01	01	01	01	01	01
2051	01	01	01	01	01	01	01
2052	01	01	01	01	01	01	01
2053	01	01	01	01	01	01	01
2054	01	01	01	01	01	01	01

BY	SEC	TIME	DATE	TIME	DATE	TIME	DATE
01	01	01	01	01	01	01	01
02	02	02	02	02	02	02	02
03	03	03	03	03	03	03	03
04	04	04	04	04	04	04	04
05	05	05	05	05	05	05	05
06	06	06	06	06	06	06	06
07	07	07	07	07	07	07	07
08	08	08	08	08	08	08	08
09	09	09	09	09	09	09	09
10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20
21	21	21	21	21	21	21	21
22	22	22	22	22	22	22	22
23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	24
25	25	25	25	25	25	25	25
26	26	26	26	26	26	26	26
27	27	27	27	27	27	27	27
28	28	28	28	28	28	28	28
29	29	29	29	29	29	29	29
30	30	30	30	30	30	30	30
31	31	31	31	31	31	31	31
32	32	32	32	32	32	32	32
33	33	33	33	33	33	33	33
34	34	34	34	34	34	34	34
35	35	35	35	35	35	35	35
36	36	36	36	36	36	36	36
37	37	37	37	37	37	37	37
38	38	38	38	38	38	38	38
39	39	39	39	39	39	39	39
40	40	40	40	40	40	40	40
41	41	41	41	41	41	41	41
42	42	42	42	42	42	42	42
43	43	43	43	43	43	43	43
44	44	44	44	44	44	44	44
45	45	45	45	45	45	45	45
46	46	46	46	46	46	46	46
47	47	47	47	47	47	47	47
48	48	48	48	48	48	48	48
49	49	49	49	49	49	49	49
50	50	50	50	50	50	50	50
51	51	51	51	51	51	51	51
52	52	52	52	52	52	52	52
53	53	53	53	53	53	53	53
54	54	54	54	54	54	54	54
55	55	55	55	55	55	55	55
56	56	56	56	56	56	56	56
57	57	57	57	57			

**00000000**

[illegible][illegible][illegible]

# RS232 On The Plus/4

*19,200 baud on the Plus/4? A Beeb listing in a  
Commodore mag? Are we kidding you? We certainly  
aren't. . .*

*By R C Homes*

**S**urprising though it may seem, the Plus/4 is a lot faster at communicating using RS232 than the 64. This is due to the 64 using a software simulation to copy the action of the 6550 ACIA IC which would normally be used for RS232. Indeed, the 64 is so slow that it often misses characters even at the leisurely 300 baud.

The Plus/4 on the other hand, has a 6550 which handles all the RS232 signals except CTS which is dealt with by a 6529. Also, there is no need to connect 5-volt pin B (as suggested in 'Interfacing with the RS232', *Teac Commodore*, January 1987, p 82-90).

The Plus/4 software has the ability to use XON/XOFF flow control with the user's choice of XON/XOFF characters. These are normally CTL/S for XOFF and CTL/Q for XON. This facility is used to stop the remote device from transmitting more data when the receiving device has no more room in its input buffer, and to restart the remote device when the receiving device has removed enough characters from its buffer.

The Plus/4 has a dedicated 64-byte RS232 user receive buffer located at \$60F7, to \$60A6, and a one-byte system transmit buffer at \$60A7 which is used to hold the current XON/XOFF character.

If the ACIA is configured, the interrupt handler will call two subroutines to handle RS232 interrupts. The first routine

```

5 REM BBC PROGRAM TO TEST PLUS/4 TO BBC RS232 AT 19200 BAUD
10 #DEF B
20 #DEF B
30 #DEF B
40 #DEF B
50 FOR I=0 TO 255
60 PO=POKE$B(I)
70 IF ADDRESS$=B THEN
80 PO=POKE$B(I)
90 IF ADDRESS$=B THEN
100 PRINT B(I)
110 NEXT I
120 GOTO 10

5 REM PLUS/4 PROGRAM TO TEST PLUS/4 TO BBC RS232 AT 19200 BAUD
10 OPEN$=2:PO=POKE$B(15)+POKE$C(1)
20 PO=POKE$C(1)+1:PO=POKE$C(1)+1:PO=POKE$C(1)+1
30 GOTO 10
40 IF PO=POKE$C(1) THEN
50 GOTO 10

```

*Listings 1 and 2, programs for the BBC B (top)  
and the Plus/4 (top) show transmitting from the BBC  
to the Plus/4 at 19,200 baud.*

Checks for a remote device, initiates XON/XOFF sequence and handles it appropriately;

Checks user receive buffer is full, and if so then ignores this received character and returns;

If there is room for eight characters, then it sets various flags, and stores XOFF character from SPID into the output (transmit) buffer and puts the received character in the user input buffer.

The second routine called with Check AC1A (transmit buffer empty and return if not);

Check for CTS signal low, and return if so;

Check input buffer full flag, and send either XOFF or XON as appropriate.

It is the job of the RS232 portion of the CHRN routine to reset the user

buffer-full and remote-paused flags and initiate sending of the XON character.

Note that the XON/XOFF protocol is used only if the user has FORN'd the XON/XOFF characters into SPIC and SPID respectively; if these two locations are zero then characters received when the buffer is full are ignored.

### And The Proof...

I have tested the Plus/4 connected to a BBC Model B, running at 9.200 baud, with the BBC sending the Plus/4 at half speed, and over a one hour period not a single character was lost by the Plus/4. The two programs for the Plus/4 and the BBC are shown in Listing 1 and 2.

Unfortunately, there is a bug in the Plus/4 ROM RS232 routines, which

causes the Plus/4 to crash immediately after it has transmitted the first XON remote character, and the rest of this article describes how to fix this bug.

First we need to make our own copy of the Kernel ROM, and then patch the incorrect code. This is not as easy... Listing 3 is a listing of a Basic Program and a machine code program which copy the ROM down into RAM, cause the new version of the Kernel to be executed, and inhibit switching back to ROM. The top of memory pointers are also reset to \$FFFF, and the bad code in the RAM copy is fixed. The Basic program must be typed in **exactly** as shown, with **no** additional spaces, etc, as the machine code program is immediately above it in \$4000.

A disassembly of the RS232 code in the Kernel is included in figure 3.

```
1  P00051:0aP00053:0:P00055:0:P00057:128:P00059:128:P00061:128:P00063:128:P00065:128:P00067:128:P00069:128:P00071:128:P00073:128:P00075:128:P00077:128:P00079:128:P00081:128:P00083:128:P00085:128:P00087:128:P00089:128:P00091:128:P00093:128:P00095:128:P00097:128:P00099:128:P00101:128:P00103:128:P00105:128:P00107:128:P00109:128:P00111:128:P00113:128:P00115:128:P00117:128:P00119:128:P00121:128:P00123:128:P00125:128:P00127:128:P00129:128:P00131:128:P00133:128:P00135:128:P00137:128:P00139:128:P00141:128:P00143:128:P00145:128:P00147:128:P00149:128:P00151:128:P00153:128:P00155:128:P00157:128:P00159:128:P00161:128:P00163:128:P00165:128:P00167:128:P00169:128:P00171:128:P00173:128:P00175:128:P00177:128:P00179:128:P00181:128:P00183:128:P00185:128:P00187:128:P00189:128:P00191:128:P00193:128:P00195:128:P00197:128:P00199:128:P00201:128:P00203:128:P00205:128:P00207:128:P00209:128:P00211:128:P00213:128:P00215:128:P00217:128:P00219:128:P00221:128:P00223:128:P00225:128:P00227:128:P00229:128:P00231:128:P00233:128:P00235:128:P00237:128:P00239:128:P00241:128:P00243:128:P00245:128:P00247:128:P00249:128:P00251:128:P00253:128:P00255:128:P00257:128:P00259:128:P00261:128:P00263:128:P00265:128:P00267:128:P00269:128:P00271:128:P00273:128:P00275:128:P00277:128:P00279:128:P00281:128:P00283:128:P00285:128:P00287:128:P00289:128:P00291:128:P00293:128:P00295:128:P00297:128:P00299:128:P00301:128:P00303:128:P00305:128:P00307:128:P00309:128:P00311:128:P00313:128:P00315:128:P00317:128:P00319:128:P00321:128:P00323:128:P00325:128:P00327:128:P00329:128:P00331:128:P00333:128:P00335:128:P00337:128:P00339:128:P00341:128:P00343:128:P00345:128:P00347:128:P00349:128:P00351:128:P00353:128:P00355:128:P00357:128:P00359:128:P00361:128:P00363:128:P00365:128:P00367:128:P00369:128:P00371:128:P00373:128:P00375:128:P00377:128:P00379:128:P00381:128:P00383:128:P00385:128:P00387:128:P00389:128:P00391:128:P00393:128:P00395:128:P00397:128:P00399:128:P00401:128:P00403:128:P00405:128:P00407:128:P00409:128:P00411:128:P00413:128:P00415:128:P00417:128:P00419:128:P00421:128:P00423:128:P00425:128:P00427:128:P00429:128:P00431:128:P00433:128:P00435:128:P00437:128:P00439:128:P00441:128:P00443:128:P00445:128:P00447:128:P00449:128:P00451:128:P00453:128:P00455:128:P00457:128:P00459:128:P00461:128:P00463:128:P00465:128:P00467:128:P00469:128:P00471:128:P00473:128:P00475:128:P00477:128:P00479:128:P00481:128:P00483:128:P00485:128:P00487:128:P00489:128:P00491:128:P00493:128:P00495:128:P00497:128:P00499:128:P00501:128:P00503:128:P00505:128:P00507:128:P00509:128:P00511:128:P00513:128:P00515:128:P00517:128:P00519:128:P00521:128:P00523:128:P00525:128:P00527:128:P00529:128:P00531:128:P00533:128:P00535:128:P00537:128:P00539:128:P00541:128:P00543:128:P00545:128:P00547:128:P00549:128:P00551:128:P00553:128:P00555:128:P00557:128:P00559:128:P00561:128:P00563:128:P00565:128:P00567:128:P00569:128:P00571:128:P00573:128:P00575:128:P00577:128:P00579:128:P00581:128:P00583:128:P00585:128:P00587:128:P00589:128:P00591:128:P00593:128:P00595:128:P00597:128:P00599:128:P00601:128:P00603:128:P00605:128:P00607:128:P00609:128:P00611:128:P00613:128:P00615:128:P00617:128:P00619:128:P00621:128:P00623:128:P00625:128:P00627:128:P00629:128:P00631:128:P00633:128:P00635:128:P00637:128:P00639:128:P00641:128:P00643:128:P00645:128:P00647:128:P00649:128:P00651:128:P00653:128:P00655:128:P00657:128:P00659:128:P00661:128:P00663:128:P00665:128:P00667:128:P00669:128:P00671:128:P00673:128:P00675:128:P00677:128:P00679:128:P00681:128:P00683:128:P00685:128:P00687:128:P00689:128:P00691:128:P00693:128:P00695:128:P00697:128:P00699:128:P00701:128:P00703:128:P00705:128:P00707:128:P00709:128:P00711:128:P00713:128:P00715:128:P00717:128:P00719:128:P00721:128:P00723:128:P00725:128:P00727:128:P00729:128:P00731:128:P00733:128:P00735:128:P00737:128:P00739:128:P00741:128:P00743:128:P00745:128:P00747:128:P00749:128:P00751:128:P00753:128:P00755:128:P00757:128:P00759:128:P00761:128:P00763:128:P00765:128:P00767:128:P00769:128:P00771:128:P00773:128:P00775:128:P00777:128:P00779:128:P00781:128:P00783:128:P00785:128:P00787:128:P00789:128:P00791:128:P00793:128:P00795:128:P00797:128:P00799:128:P00801:128:P00803:128:P00805:128:P00807:128:P00809:128:P00811:128:P00813:128:P00815:128:P00817:128:P00819:128:P00821:128:P00823:128:P00825:128:P00827:128:P00829:128:P00831:128:P00833:128:P00835:128:P00837:128:P00839:128:P00841:128:P00843:128:P00845:128:P00847:128:P00849:128:P00851:128:P00853:128:P00855:128:P00857:128:P00859:128:P00861:128:P00863:128:P00865:128:P00867:128:P00869:128:P00871:128:P00873:128:P00875:128:P00877:128:P00879:128:P00881:128:P00883:128:P00885:128:P00887:128:P00889:128:P00891:128:P00893:128:P00895:128:P00897:128:P00899:128:P00901:128:P00903:128:P00905:128:P00907:128:P00909:128:P00911:128:P00913:128:P00915:128:P00917:128:P00919:128:P00921:128:P00923:128:P00925:128:P00927:128:P00929:128:P00931:128:P00933:128:P00935:128:P00937:128:P00939:128:P00941:128:P00943:128:P00945:128:P00947:128:P00949:128:P00951:128:P00953:128:P00955:128:P00957:128:P00959:128:P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```

# PLUS/4 UTILITY

1068 87 3F	LDA	208F5F	FINDDST ALL ROM BATTERIES
106C 88 82 04	STA	80482	
106F 88 9C 04	STA	8049C	
1072 88 AC 04	STA	804AC	
1075 88 B7 04	STA	804B7	
1078 88 C2 04	STA	804C2	
107D 88 CB 04	STA	804CB	
107E 88 D8 04	STA	804D8	
1081 88 E3 04	STA	804E3	
1084 88 F1 07	STA	807F1	
1087 88 32 81	STA	88132	
108A 88 4C 81	STA	8814C	
108B 88 88 CF	STA	8CF88	
1090 88 FF FF	STA	8FFF7	
1093 88 3F FF	STA	8FF3F	SWITCH TO RAM
1096 A9 4C	LDA	284C	SPUT JMP SECS AT 1010
1098 88 18 CB	STA	8CB18	
109B A9 C5	LDA	28C0C5	
109E 88 1C CB	STA	8CB1C+1	
10A0 A9 CE	LDA	28C0CE	
10A2 88 18 CB	STA	8CB18+2	
10A5 A2 08	LDA	2808	JUMP CODE TO PATCH AREA
10A7 88 82 10	LPS LDA	8282	
10A8 98 CD CE	STA	8CEC98	
10AB CA	BOX		
10AE 10 FT	BPL	LPS	
10B0 58	CLI		
10B1 80	RTI		
10B2 86 CF 07	PCB STA	807CF	SAVE CH IN SYSTEM O/P BUFFER
10B5 68	PLA		PULL NEXT USER INPUT CHAR
10B8 4C 18 88	JMP	8818	RETURN TO 85212 ROUTINE

Listing 4: The Plus/4 RS232 routines.

TRANSMIT RS232 CHARACTER, ENTERED FROM IRQ ROUTINE AT SC028

```

E858 A0 04 07 5E450    LDR 80704    GET ACIA STATUS
E85E 29 30            AND 4810      TX DATA REG FLAG
E860 00 32            BEQ 8E474    J=TX DATA REG NOT EMPTY
E862 00 10 00        LDR 80710    245296
E865 29 02            AND 2802      JCRS PRESENT
E867 00 20          BEQ 8E494    P=2MS, DO NOT TRANSMIT
E869 A2 30          LDR 1800
E86B 20 00 07        BIT 80700      CRYSTAL INPUT BUFFER FULL?
E86E 10 09          BPL 8E478    Z -> NO
E870 00 0F 07        LDR 80708      PRES, GET CHAR FROM TXS BUF
E873 00 00 07        STX 80700      CLEAR SYSTEM BUFFER FULL FLAG
E876 4C 00 08        JMP 1E489
E879 20 00 07 8E478    BIT 80708      CDSR INPUT BUFFER FULL?
E87C 10 18          BPL 8E494    Z -> NO
E87E 20 06 07        BIT 80706      JYES, LOCAL PAUSE SET?
E881 30 11          BEQ 8E494    Z -> YES
E883 A0 00 07        LDR 80700      JNO-GET USER CHAR TO SEND
E886 00 00 07        STX 8070E      CLEAR USER BUFFER FULL FLAG
E889 00 00 00 1E489    STA 1F000      ACIA TRANSMIT REG
E88C 00 04 07        LDR 80704      GET ACIA STATUS REG
E88F 29 0F          AND 270F      FIRST ONLY TRANSMIT DATA REG
E891 00 04 07        STA 80704      P STATUS BIT
E894 00          BEA94    RTS

```

CHECK FOR RECEIVED RS232 CHARACTER ENTERED FROM IRQ AT SC025

```

E895 00 04 07 5E450    LDR 80704    GET ACIA STATUS REG
E898 29 08          AND 4808      RECDV DATA REG FLAG
E89A 00 04          BEQ 8E4F0    P=2MS DATA REG NOT FULL
E89C A0 04 07        LDR 80704      CONT RX DATA REG FLAG
E89F 29 07          AND 2807      SECOND ONLY RX DATA REG

```

```

EAB1 80 84 07      STA 80F84      J STATUS BIT
EAB4 80 00 F0      LBA 8F800      JSET ACIA NOW REGISTER
EAB7 F0 10        BEQ BEAC2      J -> NO DATA OR NULL
EAB7 80 85 07      STA 80F85      LEAVE THE CHAR
EAB0 C5 F0        CMP 8FC        JIS IT 80N CHARACTER?
EAB6 80 07        BNE BE8B7      J -> NO
      RECEIVED 80N REMOTE ENR WANTS US TO RESTART TRANSMISSION
E8B0 4F 10        LBA 1800      JYES, CLEAR
E8B2 80 86 07      STA 80F86      J LOCAL PAUSE FLAG
EAB5 F0 3F        BEQ BEAC8      J AND RETURN
EAB7 C5 F0 81AB7  CMP 8FD        JIS IT XOFF CHARACTER?
EAB7 80 07        BNE BEAC2      J -> NO
      RECEIVED XOFF CHARACTER, REMOTE ENR WANTS US TO STOP TRANSMISSION
EAB8 8F FF        LBA 18FF      JYES, SET LOCAL
EAB8 80 86 07      STA 80F86      J PAUSE FLAG
EAC0 80 20        BNE BE8FD      J AND RETURN
EAC2 80 83 07 BEAC2 LBA 80F83      ONCHAR IN 80N INPUT BUFFER
EAC5 C9 10        CMP 183F      CFULL?
EAC7 F0 27        BEQ BE8FD      J -> YES
EAC9 C9 10        CMP 183B      JNO, AT THRESHOLD FOR XOFF?
EACB 80 0F        BNE BE8BC      J -> NO
EAC6 85 F0        LBA 8F8      JYES, SET XOFF CHAR
EACF F0 00        BEQ BE8BC      J -> NO XOFF CHAR DEFINED
EAB1 80 0F 07      STA 80F0F      XPUT IN SYSTEM O/P BUFFER
EAB4 A9 FF        LBA 18FF
EAB6 80 80 07      STA 80F80      JSET SYSTEM BUFFER FULL FLC
EAB9 80 87 07      STA 80F87      JSET REMOTE PAUSE FLAG
EAB0 80 81 07 BEAC0 LBA 80F81      JSET USER I/P BUFFER INDEX
EABF E8          ENX          JABD ONE
EAB0 8A          TBA
EAC1 29 3F        BND 183F      JBACK INHER 80B 84 AND

```

```

0003 04 01 07      STA 00704      J STORE NEW INDEX
0004 04      TAX      JGET INDEX IN J
0007 00 05 07      LDA 00705      JGET RECEIVED CHAR
000A 00 07 05      STA 003F7.5    J AND STORE IN USER I/P BUF
000D 00 05 07      ENQ 00705      JCHARG IN USE I/P BUFFER
0010 00      BRWD      RTS

```

## CONTINUATION OF CHRG FOR R5252 DEVICE

```

0011 00 05 07 BRWD      LDA 00705      JCHARG IN USE I/P BUFFER
0014 00 14      BEQ 0002A      J -> EMPTY
0016 00      RMP      JHAVE INHIBIT STATUS
0017 00      SEI
0018 00 03 07      LAR 00702      J/I/P & FETCH INDEX
001B 00      INR      JMOD ONE
001C 04      TXR
001D 00 3F      AND 003F      JMASK MOD 64
001F 00 02 07      STB 00702      J AND RESTORE IT
0022 00      PLP      JRECOVER INHIBIT BIT
0023 0A      TRX
0024 00 07 05      LDA 003F7.5    JGET NEXT CHAR FROM I/P BUF
0027 00      PHA      J ONTO STACK
0028 00 03 07      DEC 00705      JDECREMENT RCHARG IN BUF
002B 00 03 07      LDA 00705      JGET RCHARG IN I/P BUF
002E 00 00      CMP 2800
0030 00 10      BNE 00020      J -> RCHARG < 0
0032 00 07 07      BIT 00707      JIS RCHRG PRIME FLAG SET?
0035 10 14      BPL 00020      J -> NO
0037 05 00      LBA 0FC      JIS XON CHAR DEFINED?
0039 00 10      BEQ 00020      J -> NO
003A 00 0F 07      STA 0070F      JYES, PUT IT IN EYS OFF BUF

```

HERE IS THE BUS. THE NEXT CHARACTER TO BE RETURNED TO THE USER  
IS THE TOP ENTRY ON THE STACK. A PLA SHOULD BE DONE HERE.

```

0010 3E          SEC
0011 4E 00 07    ROR 00700      RESET SYS BUFFER FULL FLAG
0012 4E 07 07    LSR 00707      7 AND REMOTE PAUSE FLAG
0013 2C 00 07 00025  BIT 00700      PCIR PRESENT?
0014 10 00          SPL 00005      7 -> NO
0015 4E          ROR00      PRR      YES, SAVE NEXT CHAR TO SENS
0016 4E 04 07 00020  LSR 00704      POST ACIA STATUS REG
0017 2F 4E          AND 000001001  7 SAVE DIR
0018 4E 40          OR 000000000    7 AND INVERT IT
0019 03 00          STA 000      7 STORE IN KERNEL, IT WORKS
001A 6E          PLA      PRECOVER CHAR HERE
001B 1E          CLR      7FLAG NO ERROR
001C 40          RTS

      SETUP USER CHARACTER TO TRANSMIT
001D 2C 00 07 0003F  SET 00700      USER EXIT BUFFER FULL?
001E 10 00          RRI 0003F      2-YES, WAIT FOR IT TO EMPTY
001F 00 00 07      STA 00700      END, STORE USER C/P CHARACTER
0020 3E          SEC      2 IN USER EXIT BUFFER, SET
0021 4E 00 07      ROR 00700      2 USER EXIT BUFFER FULL FLAG
0022 4C 2A 00      JRP 0002A

      INITIALIZE RS232 CONSTANTS AND ACIA
0023 4F 00 00046  LRA 0000      PCLEAR ALL
0024 4F 00          LRR 0000      7 RS232
0025 20 00 07 00044  STA 00700,0  7 VARIABLES
0026 0A          SRR
0027 10 7A          SPL 0004A
0028 00 01 00      STA 00001      PRESET ACIA
0029 00 7C          STA 00C      JCLEAR XEN CHARACTER
002A 00 70          STA 000      JCLEAR XPP CHARACTER
002B 60          RTS

```





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# Windows

*Put text anywhere on the screen you want, and scroll it too, with this set of fast C64 routines.*

*By R.A. Henderson*

**H**ave you ever tried drawing windows with your 64, and then writing text to those windows in an attempt to emulate the features of the ubiquitous IBM PC? It is not a difficult task in Basic using the graphics symbols available in the Commodore character set. However, it is of limited use in this single form, and is very cumbersome to manipulate.

The routines which are presented in this article are all machine code based. They enable complex windowing tasks to be implemented easily, and provide many useful features.

With these routines you can draw a window of any size, anywhere on the screen. On removing that window, the text underneath is restored. Up to five windows can be displayed at any one time, and in all cases the text underneath is restored as each window is removed. The windows can even overlap one another. The only restriction imposed when using multiple windows, is that they must be removed in reverse order to their application.

Finally, routines are presented which allow the contents of the windows to be scrolled in any one of four directions: up, down, left and right. Indeed, multiple scrolling of different windows in different directions is possible, although this feature cannot be applied to overlapping windows.

Now, down to the routines. All the code has been written and assembled using the Supersoft Micro Assembler, but is pretty well universal. The code has been assembled starting at \$C110

so that it does not interfere with your Basic program. The program is constructed from a number of modules, and the line numbers presented with each module, whilst essentially arbitrary, do enable you to slot the modules together easily.

## Listing 1 - Variables

The first routine declares all the variables used by the program. It also identifies, in line 500, the start point for the assembly process at \$C110.

A word or two about the major variables will ease understanding of the program.

Each window is defined by four parameters: the top left-hand corner of the window frame; the number of columns and rows of text within the window; and the colour of the window frame.

The corner is identified by its memory location. This can be established by referring to the screen memory map in Appendix G of the User Manual. The top left-hand corner of the screen is \$D34 (\$B400), and the bottom right \$E23 (\$D77F). The corner must be identified as two bytes, LOCORNER and HICORNER, in normal low-high format.

The other three parameters, COLUMN, ROW and COLOUR, can all be specified as single byte numbers, and in the case of COLOUR, this is defined in Appendix G of the User Manual.

FRAME represents the parameters which make up the window frame. By referring to Appendix E of the User

Manual, you will see that 73 is the top right-hand corner of the frame, 66 is a vertical line, 79 the bottom right-hand corner, 67 a horizontal line, 72 a space, 85 the top-left corner and 94 the bottom left-hand corner. These parameters can be changed, if desired, to give alternative window outlines.

In order to restore the contents of the screen once a window is removed, it is first necessary to save these contents. To avoid wasting valuable memory space, I have chosen to store the contents of the screen under each window in that area of RAM which resides towards the Basic ROM. MEMSTRT identifies the start of each stored window in memory, using two bytes in low-high format, and starts at \$AB00. PTR points to the start of the most recent window. MEMCORN stores the corner location in two bytes, and MEMPARAM also uses two bytes to store COLUMN and ROW respectively.

A word of warning! There are no traps in the program to prevent you from specifying unstable windows. Poor specification can result in windows which wrap around the screen, or, worse, if you specify a window whose size would cause it to go beyond memory location \$FEF, then you are in grave danger of overwriting your Basic program, starting at \$B000.

## Listing 2 - Drawing a Window

Having declared our variables in Listing 1, this is the first routine which

actually does something.

To prove that this routine works, assemble it, together with the variables (Listing 1) and make the following POKES (a immediate mode):

```
POKE49427,166:POKE49428,4:
POKE49429,16:POKE49430,5:
POKE49431,5.
```

Now call SYS49431 and you should see a given window frame appear instantly on your screen.

### Listing 3 - Save and Replace Window

Before drawing a window, it is first necessary to save the screen contents under that window. Then, when you remove that window, the original screen contents can be replaced.

Now assemble Listing 3 together with Listings 1 and 2, and then repeat the series of POKES. Call SYS 49432 followed by SYS 49433 and the given window will appear. Now call SYS 49714. The window is removed, and the original screen contents replaced.

### Listings 4 and 5 - Scrolling

The routines in Listings 4 and 5 provide up, down, right, and left scrolling of the windows. If you don't want this facility, then omit these routines entirely.

We won't bother testing these routines until you've entered our final two listings, since this next listing avoids the need for all these POKES.

### Listing 6 - Data Entry

We can simplify the process of entering our window data by making use of functions already in your 64. The ones we will use are:

1. At \$E266 is the kernel ROM, which fetches the current character.
2. At \$E26E, also in the kernel, which checks for, and skips the "." character.
3. At \$A040 is the Basic ROM, which places the entered data into locations \$14 and \$15 of Zero Page.

Listing 6 accomplishes this by loading

our window parameters, LOCORNER, HICORNER, COLUMN, ROW and COLOUR, into the variables table of Listing 1.

### Listing 7 - Module Linker

I have presented you with a number of routines which can be strung together to provide a comprehensive windowing program. This test listing is self-explanatory, and simplifies the task of accessing the various functions from Basic. If you have decided to omit the scrolling routines, then delete line 996 to 998 also.

If you have entered all the code and assembled it, then you should get a start address for assembly of \$C400, and a finish address of \$C40B.

Now down to using the programs. The machine code can be accessed either from Basic or in immediate

mode as follows:-

```
Draw window: SYS 49433,CR,CM,
RW,CL
Scroll up: SYS 49435,CR,CM,
RW,CL
Scroll down: SYS 49444,CR,CM,
RW,CL
Scroll right: SYS 49451,CR,CM,
RW,CL
Scroll left: SYS 49458,CR,CM,
RW,CL
Remove window: SYS 49463
where
```

```
CR = corner location
CM = number of columns
RW = number of rows
and CL = colour
```

The best way to test the program is by experimentation, and our final listing is a short Basic program to demonstrate this. 

#### PROGRAM: 1. LISTING

```
100 : *****
110 : **
120 : **
130 : **      * WINDOW *
140 : **      *
150 : **      VERSION 04 10/01/87
160 : **
170 : *****
180 :
190 LOCORNER=STORE
200 HICORNER=STORE+1
210 COLUMN=STORE+2
220 ROW=STORE+3
230 COLOUR=STORE+4
240 Z0=OFF
250 Z1=OFF
260 Z2=OFF
270 Z3=OFF
280 DIR=1-OFF
290 :
300 --AC110
310 :
320 INPUT BYT 0
330 INPUT BYT 0
340 INPUT BYT 0
350 STORE BYT 0,0,0,0,0
360 REMOVRT BYT 000,040,0,0,0,0,0,0,0,0
370 REMOVRT BYT 0,0,0,0,0,0,0,0
380 REMOVRT BYT 0,0,0,0,0,0,0,0,0
390 :
400 : ***** WINDOW OUTLINE *****
410 FRAME BYT 73,66,75,67,32,67,65,66,74
420 :
430 :
```

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```

1100  * ** BORG SCHEMA **
1105  WINDOW LEN COLLEN
1110  DIV
1115  LDA #0
1120  JMS BORG
1125  INC
1130  LOOP1 JMS BORG
1135  BTR SCIP1
1140  BTR
1145  JMS LOOP1
1150  BTR SCIP1 INC
1155  JMS BORG
1160  BTR
1165  :
1170  BORG JMS SETUP
1175  JMS SCHEMA
1180  INC
1185  INC
1190  LDA #0
1195  BTR TEMP1
1200  LOOP2 JMS ADD1
1205  JMS BORG SCHEMA
1210  INC TEMP1
1215  LDA TEMP1
1220  BTR TEMP1
1225  INC BTR
1230  BCC LOOP2
1235  INC
1240  JMS ADD2
1245  JMS SCHEMA
1250  DIV
1255  BTR
1260  :
1265  SCHEMA JMS ADD2
1270  LDA TEMP1,X
1275  BTR ADD1,Y
1280  LDA COLLEN
1285  BTR ADD1,Y
1290  BTR
1295  :
1300  :
1305  * ** AND LINE **
1310  BCC CLC
1315  LDA #0
1320  BCC ADD2
1325  BTR #0
1330  BTR #0
1335  BCC SCIP2
1340  INC #1
1345  SCIP2 BTR
1350  :
1355  :
1360  * ** AND COLOR PENS **
1365  BCC CLC
1370  LDA #0
1375  BTR #0
1380  LDA #1
1385  BCC ADD2
1390  BTR #0
1395  BCC SCIP3
1400  BTR #1
1405  SCIP3 BTR
1410  :
1415  :
1420  SETUP LDA LOCADDR
1425  BTR #0
1430  LDA HIGADDR
1435  BTR #1
1440  BTR
1445  :
1450  :

```

```

0700 ** OPEN WINDOW **
0800 GOTO LEX FWIN
0900 LEX FLD
1000 GOTO SKIPF
1100 LEX FWINST,B
1200 LEX FLD 20
1300 LEX LDCOMMER
1400 LEX FLD 20
1500 STA FWINST,B
1600 STA TEMPF
1700 LEX COLLEN
1800 STA FWINSTAN,X
1900 LEX
2000 LEX FWINST,X
2100 LEX FLD 20
2200 LEX FWINST,X
2300 STA FWINST,X
2400 LEX FLD 20
2500 STA TEMPF
2600 LEX FLD 20
2700 LEX FWINST,X
2800 LEX
2900 STA FWIN
3000 JIM SAVE
3100 JIM SWITCH
3200 JIM SAVE
3300 LEX FWIN
3400 LEX 20
3500 STA FWINST,X
3600 GOTO
3700 LEX 20
3800 STA FWINST,B
3900 SKIPF STA
4000
4100
4200
4300 MAKE INC ROW
4400 INC ROW
4500 INC COLLEN
4600 INC COLLEN
4700 LEX 20
4800 LEX FWINST,B
4900 LEX FLD 20
5000 LEX FWINST,X
5100 LEX FLD 20
5200 STA FWINST,X
5300 INC COLLEN
5400 INC COLLEN
5500 INC COLLEN
5600 INC COLLEN
5700 INC COLLEN
5800 INC COLLEN
5900 INC COLLEN
6000 INC COLLEN
6100 INC COLLEN
6200 INC COLLEN
6300 INC COLLEN
6400 INC COLLEN
6500 INC COLLEN
6600 INC COLLEN
6700 INC COLLEN
6800 INC COLLEN
6900 INC COLLEN
7000 INC COLLEN
7100 INC COLLEN
7200 INC COLLEN
7300 INC COLLEN
7400 INC COLLEN
7500 INC COLLEN
7600 INC COLLEN
7700 INC COLLEN
7800 INC COLLEN
7900 INC COLLEN
8000 INC COLLEN
8100 INC COLLEN
8200 INC COLLEN
8300 INC COLLEN
8400 INC COLLEN
8500 INC COLLEN
8600 INC COLLEN
8700 INC COLLEN
8800 INC COLLEN
8900 INC COLLEN
9000 INC COLLEN
9100 INC COLLEN
9200 INC COLLEN
9300 INC COLLEN
9400 INC COLLEN
9500 INC COLLEN
9600 INC COLLEN
9700 INC COLLEN
9800 INC COLLEN
9900 INC COLLEN

```

[illegible]



## PROGRAM: 4.LISTING

```

3000 : ** SCROLL UP **
3010 RPTSCROLL LDA #0
3020 STA TEMP1
3030 JBR SETUP
3040 JBR MODE
3050 JBR RPTSCROLL1
3060 LDA #0
3070 JBR RPTSCROLL2
3080 :
3090 JBR SETUP
3100 JBR #001
3110 JBR SCROLL
3120 :
3130 :
3140 : ** SCROLL DOWN **
3150 RPTSCROLL LDA #0FF
3160 STA TEMP1
3170 JBR SCROLL2
3180 JBR RPTSCROLL1
3190 LDA #0FF
3200 JBR RPTSCROLL2
3210 :
3220 JBR SCROLL2
3230 CALL JBR #000
3240 STA #0
3250 JBR RPTSCROLL1
3260 RTS
3270 :
3280 :
3290 RPTSCROLL LDA #0
3300 STA
3310 LOOPT LFT COLP
3320 LDA #0
3330 STA #0
3340 STA #0
3350 STA #0
3360 STA #0
3370 STA #0
3380 STA #0
3390 STA #0
3400 STA #0
3410 STA #0
3420 STA #0
3430 STA #0
3440 STA #0
3450 STA #0
3460 STA #0
3470 STA #0
3480 STA #0
3490 STA #0
3500 STA #0
3510 STA #0
3520 STA #0
3530 STA #0
3540 STA #0
3550 STA #0
3560 STA #0
3570 STA #0
3580 STA #0
3590 STA #0
3600 STA #0
3610 STA #0
3620 STA #0
3630 STA #0
3640 STA #0
3650 STA #0
3660 STA #0
3670 STA #0
3680 STA #0
3690 STA #0
3700 STA #0
3710 STA #0
3720 STA #0
3730 STA #0
3740 STA #0
3750 STA #0
3760 STA #0
3770 STA #0
3780 STA #0
3790 STA #0
3800 STA #0
3810 STA #0
3820 STA #0
3830 STA #0
3840 STA #0
3850 STA #0
3860 STA #0
3870 STA #0
3880 STA #0
3890 STA #0
3900 STA #0
3910 STA #0
3920 STA #0
3930 STA #0
3940 STA #0
3950 STA #0
3960 STA #0
3970 STA #0
3980 STA #0
3990 STA #0

```

```

4000 JBR #001
4010 LDA #0
4020 STA
4030 STA
4040 LOOPT LDA #000
4050 STA
4060 STA LOOPT2
4070 STA
4080 :
4090 : ** SUBTRACT LINE **
4100 SUB1 DEC
4110 LDA #0
4120 STA #000
4130 STA #0
4140 STA #0
4150 STA #0
4160 STA #0
4170 STA #0
4180 STA #0
4190 STA #0
4200 STA #0
4210 STA #0
4220 STA #0
4230 STA #0
4240 STA #0
4250 STA #0
4260 STA #0
4270 STA #0
4280 STA #0
4290 STA #0
4300 STA #0
4310 STA #0
4320 STA #0
4330 STA #0
4340 STA #0
4350 STA #0
4360 STA #0
4370 STA #0
4380 STA #0
4390 STA #0
4400 STA #0
4410 STA #0
4420 STA #0
4430 STA #0
4440 STA #0
4450 STA #0
4460 STA #0
4470 STA #0
4480 STA #0
4490 STA #0
4500 STA #0
4510 STA #0
4520 STA #0
4530 STA #0
4540 STA #0
4550 STA #0
4560 STA #0
4570 STA #0
4580 STA #0
4590 STA #0
4600 STA #0
4610 STA #0
4620 STA #0
4630 STA #0
4640 STA #0
4650 STA #0
4660 STA #0
4670 STA #0
4680 STA #0
4690 STA #0
4700 STA #0
4710 STA #0
4720 STA #0
4730 STA #0
4740 STA #0
4750 STA #0
4760 STA #0
4770 STA #0
4780 STA #0
4790 STA #0
4800 STA #0
4810 STA #0
4820 STA #0
4830 STA #0
4840 STA #0
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4860 STA #0
4870 STA #0
4880 STA #0
4890 STA #0
4900 STA #0
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4930 STA #0
4940 STA #0
4950 STA #0
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4970 STA #0
4980 STA #0
4990 STA #0

```

## PROGRAM: 5.LISTING

```

4000 : ** SCROLL RIGHT **
4010 RPTSCROLL LDA #0
4020 JBR SETUP
4030 JBR #001
4040 LOOPT LDA #000
4050 STA #0
4060 STA #0
4070 STA #0
4080 STA #0
4090 STA #0
4100 STA #0
4110 STA #0
4120 STA #0
4130 STA #0
4140 STA #0
4150 STA #0
4160 STA #0
4170 STA #0
4180 STA #0
4190 STA #0
4200 STA #0
4210 STA #0
4220 STA #0
4230 STA #0
4240 STA #0
4250 STA #0
4260 STA #0
4270 STA #0
4280 STA #0
4290 STA #0
4300 STA #0
4310 STA #0
4320 STA #0
4330 STA #0
4340 STA #0
4350 STA #0
4360 STA #0
4370 STA #0
4380 STA #0
4390 STA #0
4400 STA #0
4410 STA #0
4420 STA #0
4430 STA #0
4440 STA #0
4450 STA #0
4460 STA #0
4470 STA #0
4480 STA #0
4490 STA #0
4500 STA #0
4510 STA #0
4520 STA #0
4530 STA #0
4540 STA #0
4550 STA #0
4560 STA #0
4570 STA #0
4580 STA #0
4590 STA #0
4600 STA #0
4610 STA #0
4620 STA #0
4630 STA #0
4640 STA #0
4650 STA #0
4660 STA #0
4670 STA #0
4680 STA #0
4690 STA #0
4700 STA #0
4710 STA #0
4720 STA #0
4730 STA #0
4740 STA #0
4750 STA #0
4760 STA #0
4770 STA #0
4780 STA #0
4790 STA #0
4800 STA #0
4810 STA #0
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4900 STA #0
4910 STA #0
4920 STA #0
4930 STA #0
4940 STA #0
4950 STA #0
4960 STA #0
4970 STA #0
4980 STA #0
4990 STA #0

```

```

5000 JBR
5010 JBR LOOPT2
5020 DEC COLP
5030 STA
5040 :
5050 :

```

## PROGRAM: 6.LISTING

```

600 : ** PITCH window PARAMETERS **
610 PARAMETERS JBR #000
620 STA #000000
630 STA #000000
640 JBR #000
650 STA #000000
660 JBR #000
670 STA #000000
680 JBR #000
690 STA #000000
700 JBR #000
710 STA #000000
720 STA #000000
730 STA #000000
740 STA #000000
750 STA #000000
760 STA #000000
770 STA #000000
780 STA #000000
790 STA #000000
800 STA #000000
810 STA #000000
820 STA #000000
830 STA #000000
840 STA #000000
850 STA #000000
860 STA #000000
870 STA #000000
880 STA #000000
890 STA #000000
900 STA #000000
910 STA #000000
920 STA #000000
930 STA #000000
940 STA #000000
950 STA #000000
960 STA #000000
970 STA #000000
980 STA #000000
990 STA #000000

```

## PROGRAM: 7.LISTING

```

900 : *****
910 : ** SET UP WINDOW **
920 : *****
930 JBR PARAMETERS
940 JBR #000
950 JBR #000
960 STA
970 :
980 :
990 : *****
1000 : ** REPLACE WINDOW **
1010 : *****
1020 JBR #000
1030 STA
1040 :
1050 : *****
1060 : ** SCROLL WINDOW UP **
1070 : *****
1080 JBR PARAMETERS
1090 JBR #000
1100 STA
1110 :
1120 : *****
1130 : ** SCROLL WINDOW DOWN **
1140 : *****
1150 JBR PARAMETERS
1160 JBR #000
1170 STA
1180 :
1190 : *****
1200 : ** SCROLL WINDOW RIGHT **
1210 : *****
1220 JBR #000
1230 STA
1240 :
1250 : *****
1260 : ** SCROLL WINDOW LEFT **
1270 : *****
1280 JBR PARAMETERS
1290 JBR #000
1300 STA
1310 :
1320 : *****
1330 : ** SCROLL WINDOW **
1340 : *****
1350 JBR #000
1360 STA
1370 :
1380 : *****
1390 : ** SCROLL WINDOW **
1400 : *****
1410 JBR #000
1420 STA
1430 :
1440 : *****
1450 : ** SCROLL WINDOW **
1460 : *****
1470 JBR #000
1480 STA
1490 :
1500 : *****
1510 : ** SCROLL WINDOW **
1520 : *****
1530 JBR #000
1540 STA
1550 :
1560 : *****
1570 : ** SCROLL WINDOW **
1580 : *****
1590 JBR #000
1600 STA
1610 :
1620 : *****
1630 : ** SCROLL WINDOW **
1640 : *****
1650 JBR #000
1660 STA
1670 :
1680 : *****
1690 : ** SCROLL WINDOW **
1700 : *****
1710 JBR #000
1720 STA
1730 :
1740 : *****
1750 : ** SCROLL WINDOW **
1760 : *****
1770 JBR #000
1780 STA
1790 :
1800 : *****
1810 : ** SCROLL WINDOW **
1820 : *****
1830 JBR #000
1840 STA
1850 :
1860 : *****
1870 : ** SCROLL WINDOW **
1880 : *****
1890 JBR #000
1900 STA
1910 :
1920 : *****
1930 : ** SCROLL WINDOW **
1940 : *****
1950 JBR #000
1960 STA
1970 :
1980 : *****
1990 : ** SCROLL WINDOW **
2000 : *****

```

## PROGRAM: W. L. S. T. (W. L. S. T.)

```

100 REM-INIT PROGRAM
110 REM-FULL SCREEN
120 FOR J=0 TO 9999
130 J=J+1: IF J=9999 THEN
140 FOR I=0 TO 9999
150 REM-INIT WINDOW
160 REM-INIT WINDOW
170 REM-INIT WINDOW
180 REM-INIT WINDOW
190 REM-INIT WINDOW
200 REM-INIT WINDOW
210 REM-INIT WINDOW
220 REM-INIT WINDOW
230 REM-INIT WINDOW
240 REM-INIT WINDOW
250 REM-INIT WINDOW
260 REM-INIT WINDOW
270 REM-INIT WINDOW
280 REM-INIT WINDOW
290 REM-INIT WINDOW
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870 REM-INIT WINDOW
880 REM-INIT WINDOW
890 REM-INIT WINDOW
900 REM-INIT WINDOW
910 REM-INIT WINDOW
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930 REM-INIT WINDOW
940 REM-INIT WINDOW
950 REM-INIT WINDOW
960 REM-INIT WINDOW
970 REM-INIT WINDOW
980 REM-INIT WINDOW
990 REM-INIT WINDOW

```

```

600 FOR J=0 TO 9999: IF J=9999 THEN
610 FOR I=0 TO 9999: IF I=9999 THEN
620 FOR K=0 TO 9999: IF K=9999 THEN
630 FOR L=0 TO 9999: IF L=9999 THEN
640 FOR M=0 TO 9999: IF M=9999 THEN
650 FOR N=0 TO 9999: IF N=9999 THEN
660 FOR O=0 TO 9999: IF O=9999 THEN
670 FOR P=0 TO 9999: IF P=9999 THEN
680 FOR Q=0 TO 9999: IF Q=9999 THEN
690 FOR R=0 TO 9999: IF R=9999 THEN
700 FOR S=0 TO 9999: IF S=9999 THEN
710 FOR T=0 TO 9999: IF T=9999 THEN
720 FOR U=0 TO 9999: IF U=9999 THEN
730 FOR V=0 TO 9999: IF V=9999 THEN
740 FOR W=0 TO 9999: IF W=9999 THEN
750 FOR X=0 TO 9999: IF X=9999 THEN
760 FOR Y=0 TO 9999: IF Y=9999 THEN
770 FOR Z=0 TO 9999: IF Z=9999 THEN
780 FOR AA=0 TO 9999: IF AA=9999 THEN
790 FOR AB=0 TO 9999: IF AB=9999 THEN
800 FOR AC=0 TO 9999: IF AC=9999 THEN
810 FOR AD=0 TO 9999: IF AD=9999 THEN
820 FOR AE=0 TO 9999: IF AE=9999 THEN
830 FOR AF=0 TO 9999: IF AF=9999 THEN
840 FOR AG=0 TO 9999: IF AG=9999 THEN
850 FOR AH=0 TO 9999: IF AH=9999 THEN
860 FOR AI=0 TO 9999: IF AI=9999 THEN
870 FOR AJ=0 TO 9999: IF AJ=9999 THEN
880 FOR AK=0 TO 9999: IF AK=9999 THEN
890 FOR AL=0 TO 9999: IF AL=9999 THEN
900 FOR AM=0 TO 9999: IF AM=9999 THEN
910 FOR AN=0 TO 9999: IF AN=9999 THEN
920 FOR AO=0 TO 9999: IF AO=9999 THEN
930 FOR AP=0 TO 9999: IF AP=9999 THEN
940 FOR AQ=0 TO 9999: IF AQ=9999 THEN
950 FOR AR=0 TO 9999: IF AR=9999 THEN
960 FOR AS=0 TO 9999: IF AS=9999 THEN
970 FOR AT=0 TO 9999: IF AT=9999 THEN
980 FOR AU=0 TO 9999: IF AU=9999 THEN
990 FOR AV=0 TO 9999: IF AV=9999 THEN

```

## PROGRAM: WINDOW LAYOUT

This is a Basic loaded file  
all of the screen windows.  
The user can then load the  
the window layout.

10 REM-INIT WINDOW LAYOUT

20 FOR J=0 TO 9999: IF J=9999 THEN

30 FOR I=0 TO 9999: IF I=9999 THEN

40 FOR K=0 TO 9999: IF K=9999 THEN

50 FOR L=0 TO 9999: IF L=9999 THEN

60 FOR M=0 TO 9999: IF M=9999 THEN

70 FOR N=0 TO 9999: IF N=9999 THEN

80 FOR O=0 TO 9999: IF O=9999 THEN

90 FOR P=0 TO 9999: IF P=9999 THEN

100 FOR Q=0 TO 9999: IF Q=9999 THEN

110 FOR R=0 TO 9999: IF R=9999 THEN

120 FOR S=0 TO 9999: IF S=9999 THEN

130 FOR T=0 TO 9999: IF T=9999 THEN

140 FOR U=0 TO 9999: IF U=9999 THEN

150 FOR V=0 TO 9999: IF V=9999 THEN

160 FOR W=0 TO 9999: IF W=9999 THEN

170 FOR X=0 TO 9999: IF X=9999 THEN

180 FOR Y=0 TO 9999: IF Y=9999 THEN

190 FOR Z=0 TO 9999: IF Z=9999 THEN

200 FOR AA=0 TO 9999: IF AA=9999 THEN

210 FOR AB=0 TO 9999: IF AB=9999 THEN

220 FOR AC=0 TO 9999: IF AC=9999 THEN

230 FOR AD=0 TO 9999: IF AD=9999 THEN

240 FOR AE=0 TO 9999: IF AE=9999 THEN

250 FOR AF=0 TO 9999: IF AF=9999 THEN

260 FOR AG=0 TO 9999: IF AG=9999 THEN

270 FOR AH=0 TO 9999: IF AH=9999 THEN

280 FOR AI=0 TO 9999: IF AI=9999 THEN

290 FOR AJ=0 TO 9999: IF AJ=9999 THEN

300 FOR AK=0 TO 9999: IF AK=9999 THEN

310 FOR AL=0 TO 9999: IF AL=9999 THEN

320 FOR AM=0 TO 9999: IF AM=9999 THEN

330 FOR AN=0 TO 9999: IF AN=9999 THEN

340 FOR AO=0 TO 9999: IF AO=9999 THEN

350 FOR AP=0 TO 9999: IF AP=9999 THEN

360 FOR AQ=0 TO 9999: IF AQ=9999 THEN

370 FOR AR=0 TO 9999: IF AR=9999 THEN

380 FOR AS=0 TO 9999: IF AS=9999 THEN

390 FOR AT=0 TO 9999: IF AT=9999 THEN

400 FOR AU=0 TO 9999: IF AU=9999 THEN

410 FOR AV=0 TO 9999: IF AV=9999 THEN

420 FOR AW=0 TO 9999: IF AW=9999 THEN

430 FOR AX=0 TO 9999: IF AX=9999 THEN

440 FOR AY=0 TO 9999: IF AY=9999 THEN

450 FOR AZ=0 TO 9999: IF AZ=9999 THEN

460 FOR BA=0 TO 9999: IF BA=9999 THEN

470 FOR BB=0 TO 9999: IF BB=9999 THEN

480 FOR BC=0 TO 9999: IF BC=9999 THEN

490 FOR BD=0 TO 9999: IF BD=9999 THEN

500 FOR BE=0 TO 9999: IF BE=9999 THEN

510 FOR BF=0 TO 9999: IF BF=9999 THEN

520 FOR BG=0 TO 9999: IF BG=9999 THEN

530 FOR BH=0 TO 9999: IF BH=9999 THEN

540 FOR BI=0 TO 9999: IF BI=9999 THEN

550 FOR BJ=0 TO 9999: IF BJ=9999 THEN

560 FOR BK=0 TO 9999: IF BK=9999 THEN

570 FOR BL=0 TO 9999: IF BL=9999 THEN

580 FOR BM=0 TO 9999: IF BM=9999 THEN

590 FOR BN=0 TO 9999: IF BN=9999 THEN

600 FOR BO=0 TO 9999: IF BO=9999 THEN

610 FOR BP=0 TO 9999: IF BP=9999 THEN

620 FOR BQ=0 TO 9999: IF BQ=9999 THEN

630 FOR BR=0 TO 9999: IF BR=9999 THEN

640 FOR BS=0 TO 9999: IF BS=9999 THEN

650 FOR BT=0 TO 9999: IF BT=9999 THEN

660 FOR BU=0 TO 9999: IF BU=9999 THEN

670 FOR BV=0 TO 9999: IF BV=9999 THEN

680 FOR BU=0 TO 9999: IF BU=9999 THEN

690 FOR BV=0 TO 9999: IF BV=9999 THEN

700 FOR BW=0 TO 9999: IF BW=9999 THEN

710 FOR BX=0 TO 9999: IF BX=9999 THEN

720 FOR BY=0 TO 9999: IF BY=9999 THEN

730 FOR BZ=0 TO 9999: IF BZ=9999 THEN

740 FOR CA=0 TO 9999: IF CA=9999 THEN

750 FOR CB=0 TO 9999: IF CB=9999 THEN

760 FOR CC=0 TO 9999: IF CC=9999 THEN

770 FOR CD=0 TO 9999: IF CD=9999 THEN

780 FOR CE=0 TO 9999: IF CE=9999 THEN

790 FOR CF=0 TO 9999: IF CF=9999 THEN

800 FOR CG=0 TO 9999: IF CG=9999 THEN

810 FOR CH=0 TO 9999: IF CH=9999 THEN

820 FOR CI=0 TO 9999: IF CI=9999 THEN

830 FOR CJ=0 TO 9999: IF CJ=9999 THEN

840 FOR CK=0 TO 9999: IF CK=9999 THEN

850 FOR CL=0 TO 9999: IF CL=9999 THEN

860 FOR CM=0 TO 9999: IF CM=9999 THEN

870 FOR CN=0 TO 9999: IF CN=9999 THEN

880 FOR CO=0 TO 9999: IF CO=9999 THEN

890 FOR CP=0 TO 9999: IF CP=9999 THEN

900 FOR CQ=0 TO 9999: IF CQ=9999 THEN

910 FOR CR=0 TO 9999: IF CR=9999 THEN

920 FOR CS=0 TO 9999: IF CS=9999 THEN

930 FOR CT=0 TO 9999: IF CT=9999 THEN

940 FOR CU=0 TO 9999: IF CU=9999 THEN

950 FOR CV=0 TO 9999: IF CV=9999 THEN

960 FOR CW=0 TO 9999: IF CW=9999 THEN

970 FOR CX=0 TO 9999: IF CX=9999 THEN

980 FOR CY=0 TO 9999: IF CY=9999 THEN

990 FOR CZ=0 TO 9999: IF CZ=9999 THEN

# Listings

*Get it right first time with our deluxe program system  
for the C64.*

**Y**ou may have noticed that our listings are free of those horrible little black blobs which send you searching around the keyboard for a suitable graphic symbol. You may also have noticed the fancy numbers by the side of each line of the listing. First no more, it's all part of our easy entry aid.

Instead of those messy graphics and rows of countless spaces in PRINT statements and strings we use a special coding system. The code, or mnemonic, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an ace of spades in layman's terms, and [SAIO] would mean a row of ten of those symbols.

[S+I] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+Z] means exactly the same thing except that the Command key (bottom left of the keyboard) is held down instead of the shift key.

If more than five spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SSPC4]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as: [CTRL N, DOWNLEFT, BLUE, F1C2]

This would be achieved by holding

down the CTRL key as you press N, press the cursor key five times, press the key marked BLUE while holding down the CTRL key, press the F1 key and, finally hold the Commodore key down while pressing the number two key (C2 would of course make the computer print in hexcode).

Always remember that you should only have a row of graphics characters on your screen with its square brackets and no commas, unless something like this appears:

[SS][C\*]  
In this case the two characters should have a comma between them.

On rare occasions [REV T] will appear in a listing. This is a delete symbol and is created by entering the line up to this mnemonic. Then type a closing quotation mark (SHIFT + 2) and delete it. This gets the computer out of quote mode. Hold down CTRL, and press the number nine key (RVSON), type the relevant number of reversed T's and then hold down CTRL and press zero (RVSOFF). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A list of these special cases is given in the table but remember that only one of these mnemonics will appear outside of a PRINT string; the symbol for pi. This may appear when its value is needed in a calculation so this may look something like:

[[C=C\*24][PI]\*  
Ignore the square brackets and just type in a shifted spread pointing arrow (i.e. the pi symbol).

## PROGRAMS SYSTEM CODES

```

0  REV 00000 000000 - BASIC 00000
10 00-00 000-70 000-0000
20 FOR L=0 TO 255:PRINT L:GOTO 10
30 0000 0 0 0 00000000000000000000
40 70 00000000000000000000 0000
50 0000000000000000000000000000
60 0000 0 0 0 00000000000000000000
70 0000 000000000000000000000000
80 0000000000000000000000000000
90 0000 000000000000000000000000
100 0000 000000000000000000000000
110 0000 000000000000000000000000
120 0000 000000000000000000000000
130 0000 000000000000000000000000
140 0000 000000000000000000000000
150 0000 000000000000000000000000
160 0000 000000000000000000000000
170 0000 000000000000000000000000
180 0000 000000000000000000000000
190 0000 000000000000000000000000
200 0000 000000000000000000000000
210 0000 000000000000000000000000
220 0000 000000000000000000000000
230 0000 000000000000000000000000
240 0000 000000000000000000000000
250 0000 000000000000000000000000
260 0000 000000000000000000000000
270 0000 000000000000000000000000
280 0000 000000000000000000000000
290 0000 000000000000000000000000
300 0000 000000000000000000000000
310 0000 000000000000000000000000
320 0000 000000000000000000000000
330 0000 000000000000000000000000
340 0000 000000000000000000000000
350 0000 000000000000000000000000
360 0000 000000000000000000000000
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850 0000 000000000000000000000000
860 0000 000000000000000000000000
870 0000 000000000000000000000000
880 0000 000000000000000000000000
890 0000 000000000000000000000000
900 0000 000000000000000000000000
910 0000 000000000000000000000000
920 0000 000000000000000000000000
930 0000 000000000000000000000000
940 0000 000000000000000000000000
950 0000 000000000000000000000000
960 0000 000000000000000000000000
970 0000 000000000000000000000000
980 0000 000000000000000000000000
990 0000 000000000000000000000000

```

by Eric Doyle



## Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

Type in the Checksum Program, make sure that you're not making any mistakes and save it to tape or disk.

Immediately because it will be used with most of the present and future listings appearing in Your Commodore.

At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate to one another, you have not copied the line exactly as printed—go back and check each character carefully. When you find the error simply correct it and

press RETURN again.

If you want to turn off the checker simply type STS40132 and the screen will return to the familiar blue colours. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lives you can go back to it with the same STS command.

No system is foolproof but the chances of two errors cancelling one another out are so remote that we believe our listings are more reliable than any other magazine in the world. So get typing!

BT

### Macronic Symbol Keypress

[RIGHT]		CBSR left/right
[LEFT]		SHIFT & CBSR left/right
[DOWN]		CBSR up/down
[UP]		SHIFT & CBSR up/down
[F1]		F1 key
[F2]		SHIFT & F1 key
[F3]		F3 key
[F4]		SHIFT & F3 key
[F5]		F5 key
[F6]		SHIFT & F5 key
[F7]		F7 key
[F8]		SHIFT & F7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RYSON]		CTRL & 4
[RYSOFF]		CTRL & 0

### Macronic Symbol Keypress

[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[POUND]		£
[LARRROW]		←
[UPARROW]		↑
[PS]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		rev text
[Cltow]		CBM + letter
[Kletter]		SHIFT + letter

# Software for sale

*If you think that one of our programs looks very interesting, but you can't afford the time to type it in then our software service will help you out.*

**I**t's three o'clock in the morning. You sit at the computer keyboard just finished a marathon typing session entering one of the superb programs from *Four Commodore*. Your fingers reach for the keyboard and press the letters R, U and N. You press RETURN, sit back and nothing happens.

Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how long you look or how many people help you, you can usually guarantee that at least one bit has slipped through unnoticed.

The *Four Commodore Software Service* makes available all of the programs from each issue on both cassette and disk at a price of £6.00 for disk and £4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, Times House, 179 The Malvern, Hemel Hempstead, Herts. HP1 1BB.  
TEL: (0442) 42435

please contact this address for prices and availability.

## The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs much easier. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strip containing the article type, C16 Program etc. So that you can see which programs are available on which format you will also find a couple of symbols after this strip. The symbols have the following meaning:



This symbol means that the program is available on cassette.



These programs are available on disk.

## Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk only programs on tape. There is no sense in placing a program that expects to be reading from disk on to tape.

## MARCH 1987

**SPELLING CHECKER** — for use with the Plus/4 word processor — disk only.

**NINE LINE MATRIX** — Clears 50 column displays on your C128.

**JOYSTICK READ** — Invaluable joystick routine for Basic programmers with a C64.

**LABELLER 64** — See February 1987.

**HEN DATA ENTRY** — Our machine code entry program for C64.

**WIMPS AND MUCH MORE** — An extension to our C64 Wimps program plus a foolproof INPUT system.

**DISKIT** — Memory Saver, Program Compressor and Disk Part Maker. The first three parts of this popular series for C64 and disk (Disk only).

**NURSERY RHIME LAND** — See February 1987.

**POPPER** — A game featuring Popper the green pea, for the C64.

Order codes

DISK 11MAR87 £6.00

TAPE 11MAR87 £4.00

## APRIL 1987

**CORNBAGE** — A computerised version of this popular card game, Plus/4, disk only.

**DISKIT 4** — A protection program to look after your C64 programs. (Disk only).

**DISKIT 5** — A machine code to DATA statement converter for C64. (Disk only).

**C128 KEYPAD MONITOR** — Make your numeric keypad more useful when entering data.

**LETTER WRITER** — A novel way to send musical letters to your friends. (C64).

**DOUBLE PRINT** — The bigger the better. Give your C64 double height characters.

ORDER CODE

DISK 11APR87 £6.00

TAPE 11APR87 £4.00

## MAY 1987

**LOWER CASE GRAPHICS** - Using lower case text on your C16 and Plus/4 graphics screen. (On disk only).

**C16 CHARACTER EDITOR** - A powerful character editor for the C16 and Plus/4. (On disk only).

**EVERYMAN'S GUIDE TO GRAPHICS** - All of the programs from this fascinating article.

**C64 SPRITE EDITOR** - A comprehensive sprite editor for the C64. Available for both disk and tape.

**CEEDIT 64** - A character editor with no fewer than 48 different commands. (Available for tape and disk).

**ORDER CODE**

**DISK YCMAY87 04.00 TAPE YCMAY87 04.00**

## JUNE 1987

**DUAL PROGRAMMING** - Have two programs in your Plus/4's memory at once. (On disk only).

**EMULATOR 64** - Machine code single stepper for the C64.

**SMART LISTER** - Make your listings smarter and neater with this program. (C64).

**PROCEDURES** - Easier programming for the C64 with this program.

**C64 SOURCE GENERATOR** - A powerful disassembler for the C64.

**LIST ENHANCER** - Improve the LIST command of your C64.

**ANALYSER** - A machine code debugger for the C128.

**ORDER CODE**

**DISK YJUN87**

**TAPE YJUN87**

## JULY 1987

**UTILITY COMMANDS** - This provides many vital commands missing from Basic 7.0 on the C128.

**PLUS/4 AND C64 CRUNCHER** - Speed up your programs with these handy utilities.

**PROGRAMMABLE FUNCTION KEYS** - A utility to make more use of the function keys on the C64.

**DISKIT 5** - A handy routine to convert memory to data statements on the C64. (Disk only).

**ARCADE ACTION** - Get those sprites with these handy arcade routines on the C64.

**CROSS REFERENCE** - This program helps you sort out your variables on the C64.

**SUBSIDE RUN** - A fast and stimulating game for the C64.

**ORDER CODE**

**DISK YJUL87**

**TAPE YJUL87**

Cassettes or disks are available back to March 1986. Please ring the Editorial office (01-637-0626) for details of these.

## ORDER FORM - PLEASE COMPLETE IN BLOCK CAPITALS

NAME	QTY	TAPE/DISK	ORDER CODE	PRICE
AUGUST 87		TAPE (24.00)	TD AUG 87	
AUGUST 87		DISK (26.00)	TD AUG 87	
OVERSEAS POST £1				
			TOTAL	

NAME .....

ADDRESS .....

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We will try to point out where you have made errors and place a corrected copy of the program back on to your tape or disk before we return it to you.

Do not send a program to us as soon as it stops working, please check it several times first.

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Notice: we can only deal with problems relating to programs published in *Your Commodore*.



**B**efore all you C64 addicts rush to Market to playtest their last and furious new game, *Mega-Apocalypse*, remember where you first read about it — in this month's *Your Commodore* news pages of course. The awe-struck

individual above is the game's programmer, Simon Michael, who has been working on the game since 1985 — and its beginning to show! Put pen to paper and we will give away a liver to the best caption for Simon's reaction.

Send your caption to *Your Commodore*, *Mega-Apocalypse* Competition, 1 Golden Square London W1R 3AR.

Entries must reach our office by Friday 26th August 1987.

At the *Your Commodore* office we receive hundreds of letters from readers every month. We do try and answer each individually but sometimes this is impossible due to pressure of work. If you have written to us and not received a personal reply, we apologise for this but we cannot promise to reply to every item of mail we receive. If you feel that your question or letter really needs an answer, then inclusion of an SAE will guarantee a reply, although this may still take time to arrive.

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